



OCTOBER 1997  
16-30031-101

# San Francisco RUSH THE ROCK ALCATRAZ EDITION

TM



**SIT-IN DEDICATED GAME**  
**27" (68 cm) COLOR MONITOR**

## OPERATION MANUAL

Operation & Adjustments • Testing & Problem Diagnosis  
Parts Information • Wiring Diagrams  
Accessories • Options

Look on our Website for more information. [HTTP://WWW.ATARIGAMES.COM](http://www.atarigames.com)



## **TABLE OF CONTENTS**

### **Section One - Operation**

<b>Safety Notices.....</b>	<b>1-2</b>
Product Specifications.....	1-3
Set-up Procedure.....	1-3
Product Configuration.....	1-3
Maintenance.....	1-3
Inspection and Installation.....	1-4
Linking.....	1-8
Network Operation.....	1-9
<b>Servicing.....</b>	<b>1-10</b>
<b>Game Operation.....</b>	<b>1-17</b>
Game Features.....	1-18
Player Controls.....	1-19
Operator Controls.....	1-20
Power On Tests.....	1-21
<b>Menu System Operation.....</b>	<b>1-22</b>
System Overview.....	1-22
Screen Layout.....	1-22
Organization.....	1-22
Adjust Volume.....	1-23
Statistics.....	1-24
Game Options.....	1-25
Game Difficulty.....	1-26
Number of Laps.....	1-27
Tournament Options.....	1-28
Coin Options.....	1-30
Controls Test.....	1-31
Memory Tests.....	1-32
Sound Tests.....	1-33
Disk Tests.....	1-34
Network Tests.....	1-35
Set Clock.....	1-36
Monitor Tests.....	1-37
Switches and Jumpers.....	1-38

## Section Two - Parts Information

Cabinet Left Side View.....	2-2
Cabinet Right Side View.....	2-3
Cabinet Rear View.....	2-4
Seat Assembly.....	2-5
Front Housing Assembly.....	2-6
Steering Wheel Assembly.....	2-7
Pedal Assembly.....	2-7
Coin Door Assembly.....	2-8
Power Supply Assembly.....	2-9
4-Speed Shifter.....	2-9
CPU Board Assembly.....	2-10
Motor Board Assembly.....	2-11
Audio Board Assembly.....	2-12
Other Parts Necessary.....	2-13
Line Cord Application Chart and Coin Door Chart.....	2-14

## Section Three - Cabinet Wiring

Power Wiring Diagram.....	3-2
CPU Board LED Indicator Status Charts.....	3-3
Motor Board LED Indicator Status Charts.....	3-6

## Section Four - Troubleshooting

Handling Precautions.....	4-1
Game Does Not Start.....	4-2
Game Can Not Be Played.....	4-3
Linking Problems.....	4-5
Player Control Problems.....	4-6
Audio Problems.....	4-7
Video Problems.....	4-8
Miscellaneous.....	4-9
Optional Kits.....	4-10

# **SAN FRANCISCO**

# ***RUSH THE ROCK***<sup>TM</sup>

## **SECTION ONE**

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## **OPERATION**

### **NOTICE**

Information in this manual is subject to change without notice. ATARI reserves the right to make improvements in equipment function, design, or components as progress in engineering or manufacturing methods may warrant.

Fill out and mail in the Game Registration card. Include the game serial number from the label on the rear of the cabinet. For your records, write the game serial number in the manual. SERIAL NUMBER \_\_\_\_\_

## **SAFETY NOTICES**

The following safety instructions apply to all game operators and service personnel. Specific warnings and cautions will be found throughout this manual where they apply. We recommend that you read this page before preparing your game for play.

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**HARD DISK DRIVE.** The hard disk drive must be packed in an anti-static bag. The disk drive assembly must be removed from the tray and packed in an approved shipping container (P/N 08-8068) in order to be sent in for repair or replacement. Do not stack or drop hard disk drives during installation or removal.

**TRANSPORTING THE GAME.** This game contains glass and fragile electronic devices. Do not move this game with power on. Avoid rough handling when moving the cabinet. Transport this game securely.

**AC POWER CONNECTION.** Verify that the switch on the power supply is set for 110VAC or 220VAC. Verify that motor power transformer, fluorescent lamp assembly, and fuse are correct for local line voltage.

**PROPERLY GROUND THE GAME.** To avoid electrical shocks, do not plug in the game until it has been inspected and properly grounded. This game should only be plugged into a grounded 3-wire outlet. Do not use a "cheater" plug or cut off the ground pin on the line cord.

**DISCONNECT POWER DURING REPAIRS.** To avoid electrical shock, turn off the power switch and disconnect the game from the AC power source before removing or repairing any part of the game. After servicing any parts of the unit, be sure that all ground wires and shields are secure before restoring power.

**POTENTIAL SHOCK HAZARD.** This video game system does not utilize an isolation transformer. No isolation exists between the internal cabinet AC system and the external AC line.

**PROPERLY ATTACH ALL CONNECTORS.** Be sure that the connectors on each printed circuit board (PCB) are properly connected. If they do not slip on easily, do not force them. A reversed connector may damage your game and void the warranty. Connectors are keyed to fit specific pins on each board.

**USE PROPER FUSE.** To avoid electrical shock, all replacement fuses must match the original fuse in fuse type, voltage rating, and current rating. The wrong fuse can damage a game and void the warranty.

**HANDLE FLUORESCENT TUBE AND CRT WITH CARE.** If you drop a fluorescent tube or CRT and it breaks, it will implode! Shattered glass can fly eight feet or more from the sudden force of an implosion.

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## **EPILEPSY WARNING**

A very small portion of the population has a condition which may cause them to experience epileptic seizures or have momentary loss of consciousness when viewing certain kinds of flashing lights or patterns that are present in our daily environment. These persons may experience seizures while watching some kinds of television pictures or playing certain video games. People who have not had any previous seizures may nonetheless have an undetected epileptic condition.

If you or anyone in your family has experienced symptoms linked to an epileptic condition (e.g., seizures or loss of awareness), immediately consult your physician before using any video games.

We recommend that parents observe their children while they play video games. If you or your child experience the following symptoms: dizziness, altered vision, eye or muscle twitching, involuntary movements, loss of awareness, disorientation, or convulsions, DISCONTINUE USE IMMEDIATELY and consult your physician.

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## PRODUCT SPECIFICATIONS

### Operating Requirements

<u>Location</u>	<u>Electrical Power</u>	<u>Temperature</u>	<u>Humidity</u>
Domestic	120VAC @ 60Hz 4.0 Amps	37°F to 100°F	Not to exceed 95% relative
Foreign	230VAC @ 50Hz 2.0 Amps	(5°C to 38°C)	
Japan	100VAC @ 50Hz 4.0 Amps		

### Cabinet Statistics

<u>Shipping Dimensions (Two Pieces)</u>	<u>Shipping Weight</u>	<u>Design Type</u>
Width 30.5" (77.5 cm) 28.0 (71.1 cm)	Main 400 Lbs (182 Kg)	Sit-In Dedicated Video Game
Depth 46.0" (117 cm) 31.0 (78.7 cm)	Seat 125 Lbs (56.8 Kg.)	with Linking capability
Height 67.0" (170 cm) 50.0 (127 cm)		

### Equipment Characteristics

<u>Video Display Monitor</u>	<u>Audio System</u>	<u>Currency Acceptors</u>
Medium Resolution RGB	5 Channel Audio	Standard Coin Door
27" (68.6 cm) CRT	4 Full Range Speakers	2 Coin Mechanisms, DBV ready
	1 Subwoofer	1 Coin Counter

### Game Characteristics

<u>Player Variables</u>	<u>Operator Variables</u>	<u>Diagnostics</u>
1 to 8 players per game (with Linking)	Coinage, Play Mode,	Automatic Power-Up Test
Choice of Car style, transmission, track	Difficulty, Volume,	Manual Multi-Level Menu System
Fastest Track Time Recognition	Audits, Statistics	

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## PRODUCT CONFIGURATION

### ◆ Stand Alone Units

Each game is ready to play right out of the carton. Operators may use the menu screens in the game menu system to determine the player variables in advance or leave the choices up to the players.

### ◆ Linked Units

Linking allows players to compete against each other (on one track) or as above (separate tracks). Games come with cables and couplers to link together two cabinets. Use the optional Hub Linking Kit to interconnect up to eight games. The Basic Kit brackets attach cabinets together to form an array.

### ◆ Tournaments

The tournament feature allows players to compete and win in staged contests. Up to eight players at a time may enter a contest (if all eight games are linked). Formal tournaments consist of a series of races directed by an operator or attendant. The game already has built-in set-up menus and tournament announcements. Options include winner indicator lights, remote control boxes, etc.

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## MAINTENANCE

### ◆ Viewing Glass

It is not necessary to switch off power to the game to clean the glass. Apply a mild glass cleaner to a clean cloth or sponge, then use this to wipe the viewing glass. **Do not apply the cleaner directly on the glass!** Liquid could drip down into switch or motor circuits and cause erratic game operation.

### ◆ Cabinet

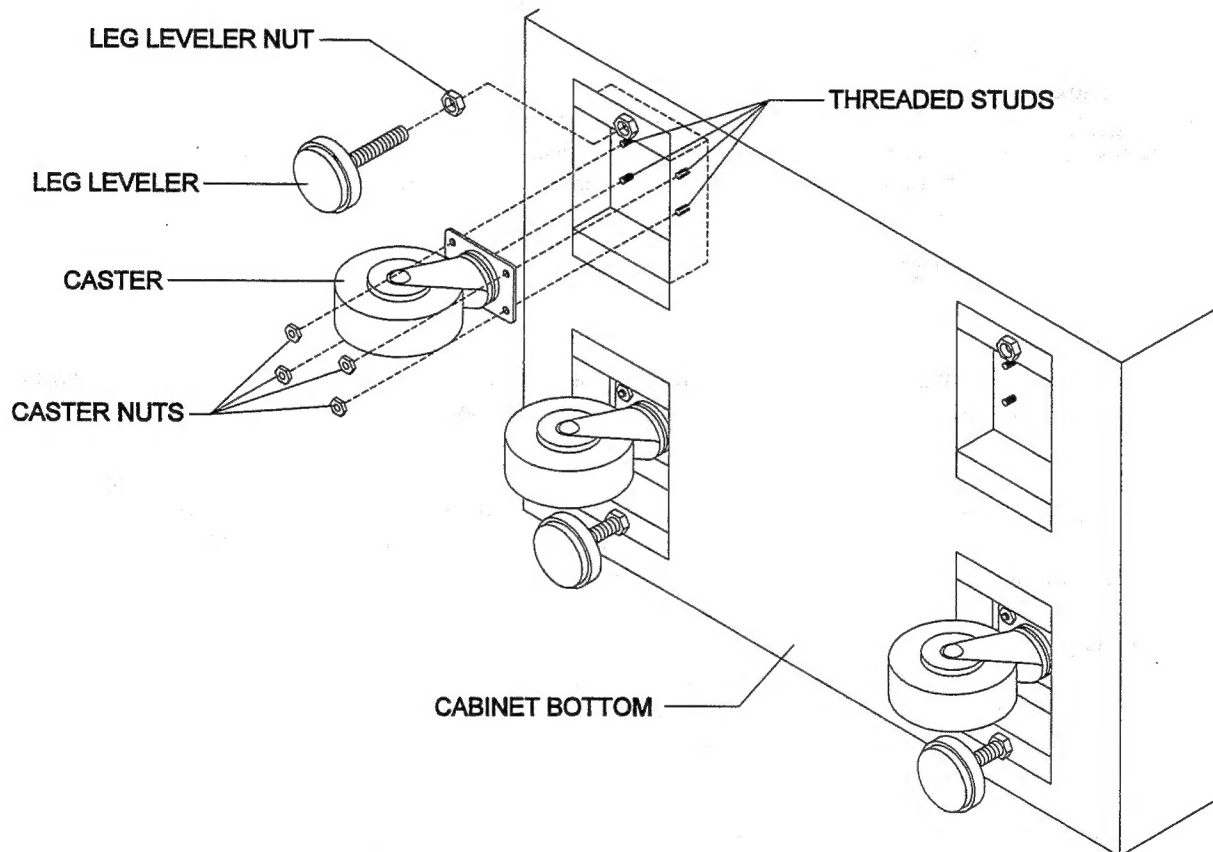
Use only non-abrasive cleaners to avoid damaging game graphics. Apply the cleaner to a clean cloth or sponge, then use this to wipe screen clean. **Do not apply the cleaner directly on the cabinet!** Liquids could enter the cabinet, damaging electronic circuits and voiding the warranty.

## INSTALLATION & INSPECTION

1. Remove straps from the shipping containers. Lift carton up and off of the game. Remove carton and lift pieces off of cardboard trays. Inspect the exterior of the cabinet and the pedestal for any damage.
2. The coin door keys are attached to the steering wheel. Unlock and open the coin door. The cash box door and rear door keys are located on a key hook attached to the inside of the coin door. Unlock and open the cash box door. Remove the tamper resistant tools and spare parts stored in the cash box.
3. Cabinet hardware is in a separate box in the carton with the pedestal. Install one nut onto each leg leveler. Tilt as needed to locate four threaded holes under the cabinet and four under the pedestal. Install a leveler and nut into each hole. Do not tighten nuts at this time.

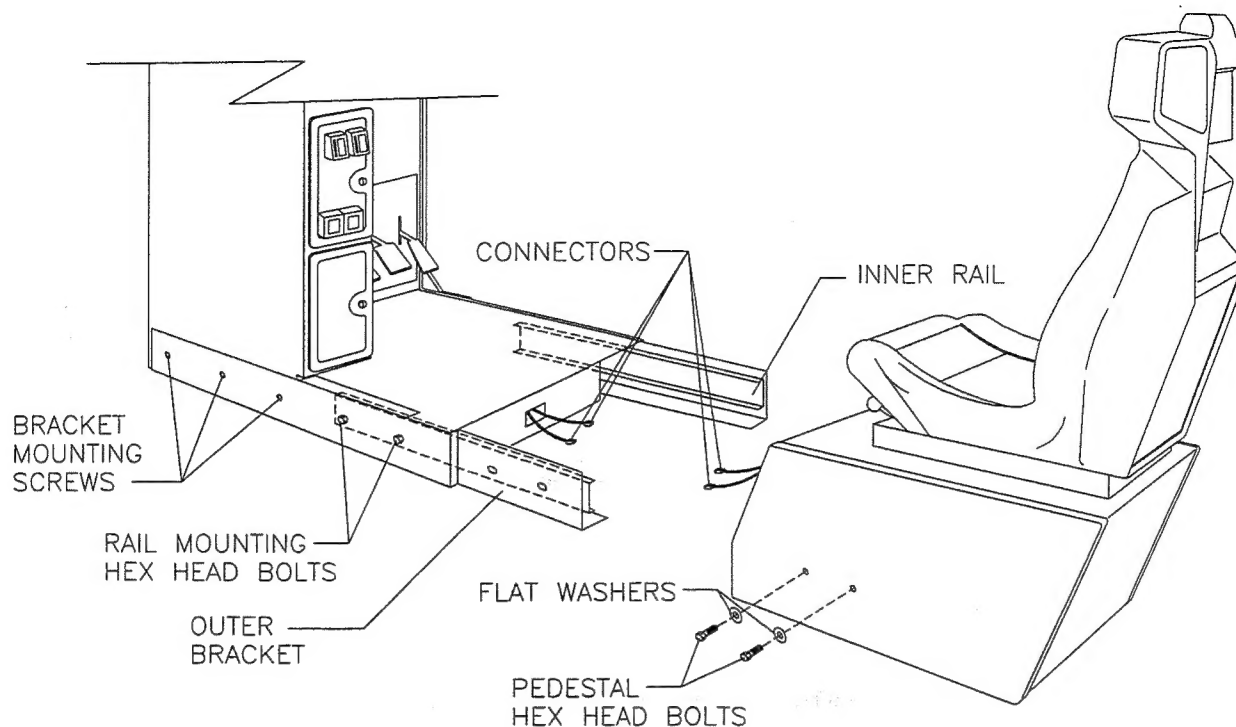


**WARNING**  
The cabinet is top heavy.



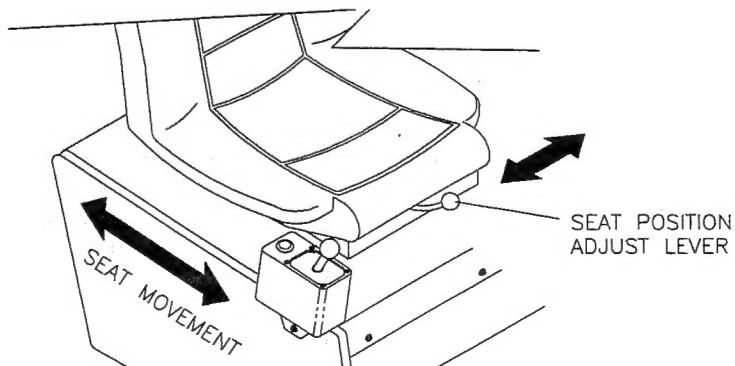
### INSTALLATION OF CASTERS AND LEG LEVELERS

4. Locate the caster wheel assemblies. Lay cabinet on its back or side and attach one caster onto each group of threaded studs. The cabinet uses four casters, one in each corner. Ensure that the levelers are raised well off of the floor when the assembled cabinet is moved.
5. Stand cabinet upright and make certain it is in a stable position. Move the game to its intended location and level the cabinet. Distribute weight equally on each corner and tighten the leveler nuts. Position the pedestal in front of the cabinet but do not lower levelers at this time.



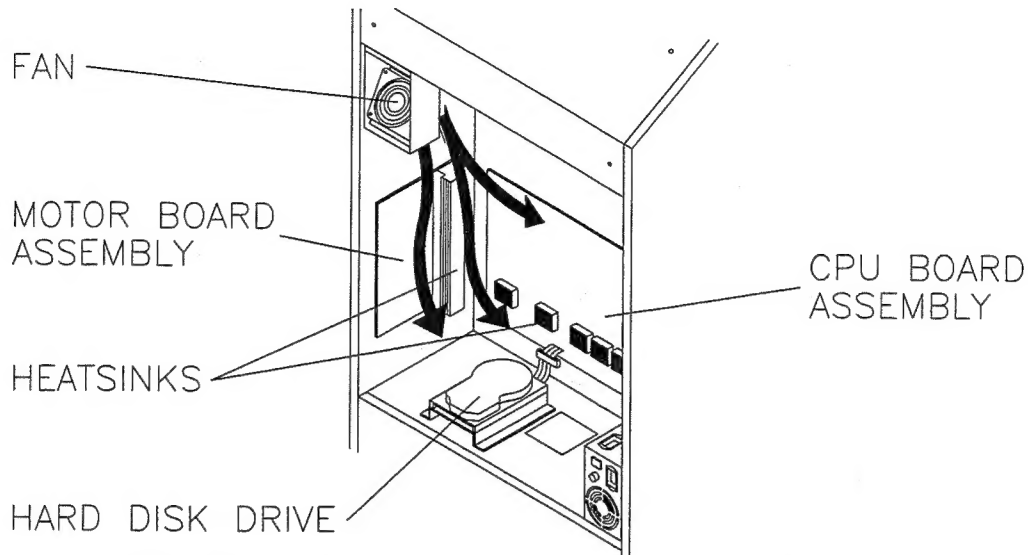
#### ATTACHMENT OF PEDESTAL TO CABINET

6. The pedestal assembly mounting rails are shipped bolted to the cabinet. Some movement is required in mounting rails to align holes with pedestal assembly. Loosen the hex head bolts holding the rails to the cabinet about three full turns. *Do not loosen the tamper-resistant bracket mounting screws.*
7. Align the openings in the pedestal with the ends of the rails. The sides of the pedestal must fit between the black outer brackets and the unpainted inner rails. Slide the pedestal forward onto the mounting rails and connect the pedestal cables to the cabinet wiring harness. Push the connectors and wires back into the cabinet opening as the pedestal is brought up against the cabinet.
8. Level the pedestal to the same height as the cabinet. Align the screw holes and attach the pedestal assembly using the hex head bolts and large flat washers supplied. Distribute weight equally on each corner and tighten the leveler nuts. Tighten all mounting rail screws firmly with a wrench.
9. Use the seat adjust lever at the front of the seat to change the seat position. The seat must move smoothly through the full range of adjustment and lock firmly in each detent position.



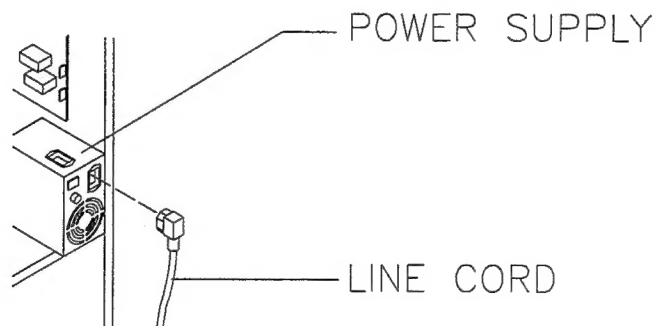
#### VERIFYING SEAT TRAVEL AND DETENT POSITIONS

10. Remove and save the screws at the top and sides of the rear door. Unlock the rear door, then lift it off of the cabinet and set it aside. Inspect the cabinet interior for any signs of damage. Check all major assemblies to assure that they are mounted securely. Ensure that nothing blocks air flow from fans.



#### CHECK INTERIOR OF CABINET BEFORE APPLYING POWER

11. Refer to the Cabinet Wiring Diagram (Section 3), and check to see that all cable connectors are correctly secured. *Do not force connectors; they are keyed to fit in only one location.* Bent pins and reversed connections may damage your game and void the warranty.
12. Use a voltmeter to determine the line voltage. The fuse, transformer, and the fluorescent lamp ballast must be rated for the measured voltage. Verify the correct power supply line voltage switch position.
13. The power cord is with the spare parts. Match the holes on the IEC plug with the prongs in the power supply receptacle and push firmly to seat the line cord.

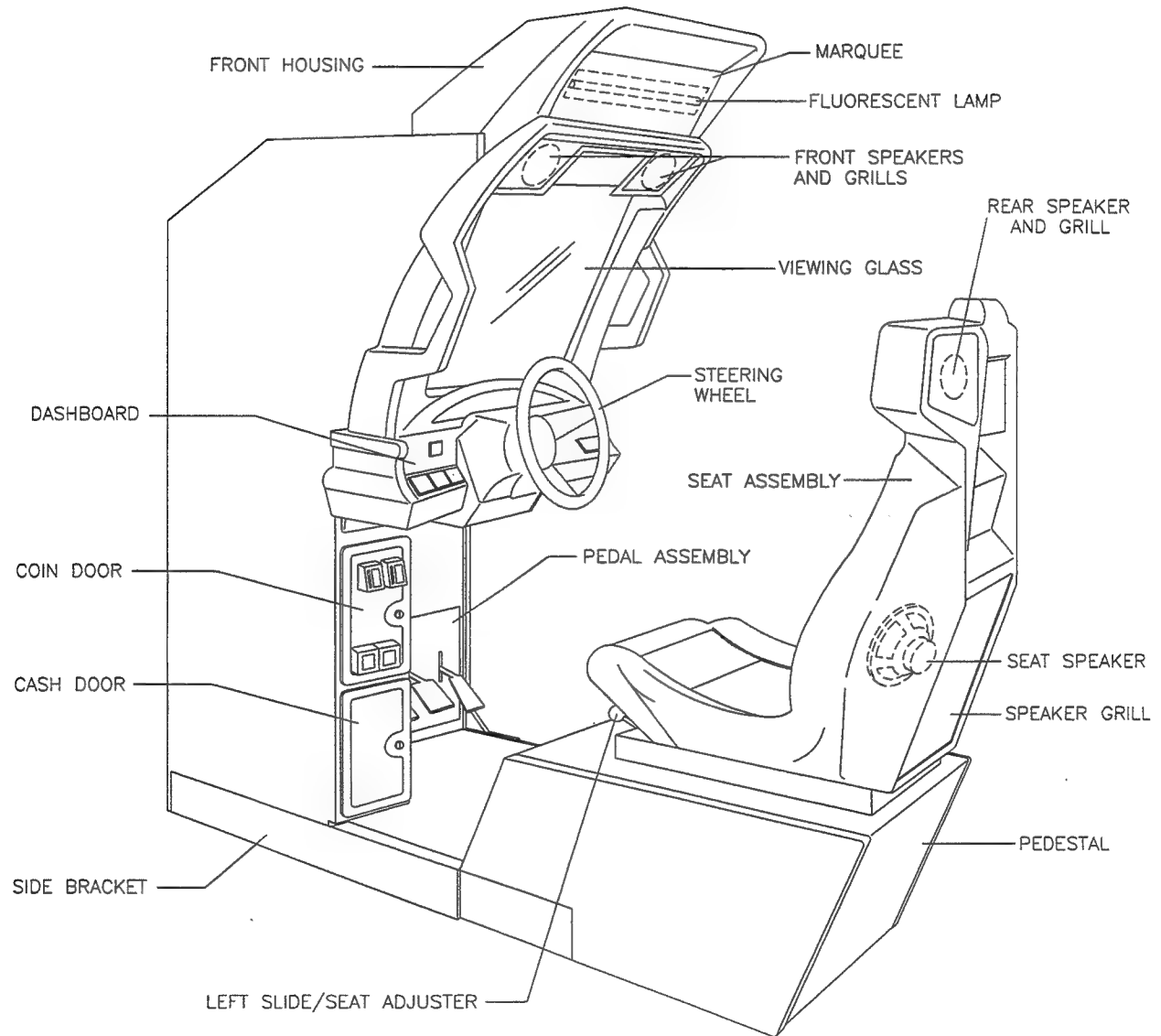


14. Reinstall the rear door onto the cabinet. Lock the rear door and remove the key. Install the screws at the top and sides of the rear door and tighten snugly. Close and lock the cash box and coin doors.

NOTE: Tamper resistant screws and wrenches are provided with this game for additional security. Four screws and the wrench are located in the spare parts bag. If desired, replace the original screws with tamper resistant screws. Tighten the screws firmly with the wrench.

15. Plug the game into a grounded (3-terminal) AC wall outlet. Switch ON the game, using the power switch located on the power supply behind the cabinet. The game will power up and begin its self-diagnostics. If no errors are found, the game will automatically enter its "attract" mode of operation. Press and release the gas, brake, and clutch pedals as instructed to calibrate the player controls.

## CABINET ASSEMBLY VIEW 1



## LINKING

Game cabinets may be connected together to permit simultaneous competition between players. The linking cables are installed in the games at the factory, and a crossover coupler is supplied in the spare parts. Once connected, games may be operated separately (as before), linked, or in tournament mode.

Only two cabinets can be linked with the parts supplied. Up to eight cabinets can be interconnected to form a Local Area Network (LAN). The optional Hub Link Kit is required to manage this network. The Hub has circuitry to prevent game errors from data collisions (several games send data at the same time, etc.).

Cabinets become more stable when they are attached together to form an array. The optional Basic Link Kit has brackets to mechanically assemble two cabinets into a single unit. One Basic Link Kit is required between each set of cabinets. The lower bracket also provides storage space for the Hub electronics.

### INTERCONNECTING GAMES

1. Verify the operation of the existing games before making any changes. Unlock the coin doors of both cabinets and press the TEST MODE switches. The GUTS and MAIN information must be the same. *Linked games must all have compatible software versions.* Newer versions may contain instructions that previous versions do not have, causing games to halt or reset at random. On-screen messages will indicate that different versions are in use when the linking feature is enabled in each game.
2. Turn OFF the power for both cabinets. Unlock and remove the cabinet rear doors. The linking cables are coiled up inside the cabinets with one end attached to a jack on the CPU Board. Cut the cable tie and locate the free end. Uncoil just enough to reach the outer side of the other cabinet, then recoil and retie the remainder of the cable. Repeat these steps for the other cabinet.
3. The crossover couplers are packed with the rest of the spare parts in the cash box. Insert the free end of each cable into one of the crossover couplers. Plug the connector into the coupler jack and press firmly. The locking tab will snap into place when the contacts are fully seated.
4. Turn ON the power for both cabinets. The games will start up and begin the Power On tests. If no serious errors are detected, the games will enter the "attract" mode automatically (there may be a few minor errors reported on screen). Refer to Section Four of the Operation Manual for assistance.
5. Press the TEST MODE switches to enter the menu system. If the car colors are identical, use the MUSIC and VIEW buttons to select GAME OPTIONS, then press the ABORT button to make this screen active. Change one or both game car colors, then press REVERSE to save the changes.
6. From the SELF TEST screen, use the MUSIC and VIEW buttons to select NETWORK TESTS, then press ABORT to begin these tests. NETWORK TESTS are described in detail later in this section.
7. When all test results are satisfactory, return to the SELF TEST menu screen and EXIT TO GAME. Start up both games and choose a linked track. The second game will have a linking message on the player choice screen. Ensure that each cabinet's controls affect the same vehicle in both games.
8. Inspect the electronics trays during game play. The CPU Board LEDs will indicate communication activity between the games. Refer to the CPU Board LED Indicator Status Chart in Section Three.
9. Retract any excess cable back into the coils in the cabinet so that the cables do not touch the floor. This keeps the cables away from the casters during relocation. If the brackets from the Basic Linking Kit have been installed (highly recommended), the coupler may be placed inside for more protection.
10. Reinstall the rear door onto the cabinet. Lock the rear door and remove the key. Install the screws at the top and sides of the rear door and tighten snugly. Close and lock the cash box and coin doors.

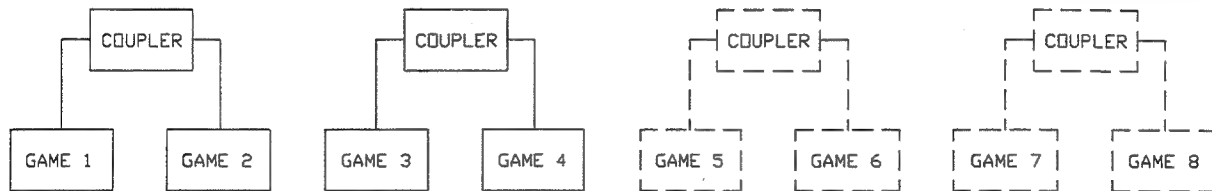
## NETWORK OPERATION

### EQUIPMENT REQUIREMENTS

Cabinets must be united together and operated in Linked Mode. Linking permits several players to race against each other in real time. As with single games, drone cars can be eliminated for head-to-head competition. The Linking program is player selectable so each cabinet can meet the needs of the players.

Games must be interconnected for linked operation. One cable is installed in each cabinet at the factory.

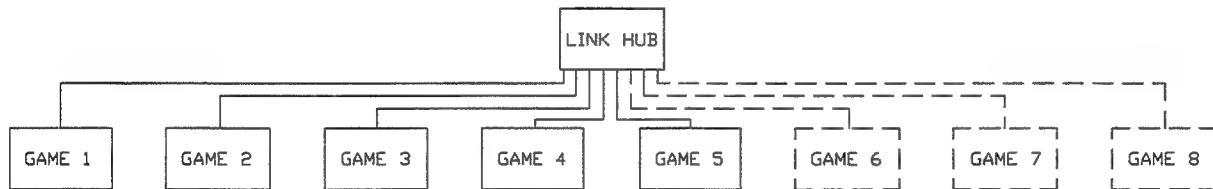
- ◆ Basic kits contain crossover coupler, brackets, and spacers needed to connect two cabinets together.



**BASIC LINKING DIAGRAM**

Each kit connects one pair of games. Passive electronics limit the cable length and the number of games. Cabinets are usually attached, but may be separated up to 30 ft. Linked pairs may be added as required.

- ◆ Hub kits contain a network hub. The active circuits allow the use of more cables of greater length.



**HUB LINKING DIAGRAM**

Each kit connects 2-8 cabinets together. Active electronics permit larger networks than basic linking kits. Cabinets are usually attached, but may be separated up to 300 ft. More cabinets can be added as needed.

Cabinets must have full two-way communication before Linked Mode is available (refer to NETWORK TESTS later in this section of the manual).

### HEAD-TO-HEAD RACING

As a player begins the track selection process, the LINKING indicator will illuminate when the games are connected. A "JOIN IN" message alerts subsequent players that a linked race is possible. If others do not begin their selection process before this message disappears from the screen, their tracks do not link (races are independent as usual for those players). Players may use the SOLO feature to decline a link.

If other players begin the selection process while the JOIN IN message is visible, the cabinets begin sending and receiving information on the network. Each additional game gets data from active cabinets in exchange for its own packet containing a unique identity, car color, player preferences, etc. A "WAITING" message indicates that other individuals are still selecting options for this race. When the last player is done selecting or the waiting period has elapsed, all linked players see the start screen simultaneously.

Late arriving players cannot participate in an ongoing linked race, but they may begin an independent race. The link automatically terminates when the game is finished, permitting another to be set up at any time.

## SERVICING

Maintenance and repairs should only be performed by qualified service personnel. The following product guidelines apply to all game operators and service personnel. Specific notes, cautions and warnings will be found throughout this manual where they apply. We recommend reading the SAFETY pages thoroughly before beginning service.

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**This game uses complex electronic components that are very SENSITIVE to static electricity. The following precautions must be observed and followed prior to handling game electronics.**

1. **Ensure that the A.C. power to the game is turned OFF prior to servicing the electronics.**
2. **Discharge any static electricity build up in your body by touching the metal power supply chassis. This must be done BEFORE touching or handling the electronic assemblies.**
3. **Store the electronic assemblies in an anti-static area. Anti-static bags are to be used to store or transport the game CPU Board Assembly or the Hard Disk Drive Assembly.**
4. **DO NOT remove or connect any electronic assemblies when the cabinet power is ON. Doing so will damage the electronic assemblies and void the warranty.**
5. **Always replace ground wires, shields, safety covers, etc. when maintenance or service is completed. All cabinet metal assemblies must have low resistance connection to ground.**

### ◆ Gear Shift and Housing

Switch off power to the game. Remove four mounting screws from shift plate. Lift switch assembly up and out of the housing. Disconnect wiring from harness. Remove screws, bracket, and housing.

### ◆ Seat Assembly

Switch off power to the game. Remove gear shift switch assembly, bracket, and shifter housing. Remove two left and two right screws from seat plate at sides of seat. Remove three front and three rear seat plate mounting screws. Raise front of seat plate up until it clears the pedestal, then slide back and up. Disconnect the wiring and remove assembly.

**IMPORTANT:** Apply removable anaerobic adhesive thread lock (Loctite Blue 242 or equivalent) and torque each bolt to seven to nine ft.-lbs (84 to 108 in.-lbs) during re-assembly of seat or slide parts.

### ◆ Seat Slide Assembly

Switch off power to the game. Remove gear shift, bracket and shifter housing. Remove seat plate from pedestal and disconnect wiring. Remove plate mounting bolts and seat slide mounting bolts.

### ◆ Pedal Assembly

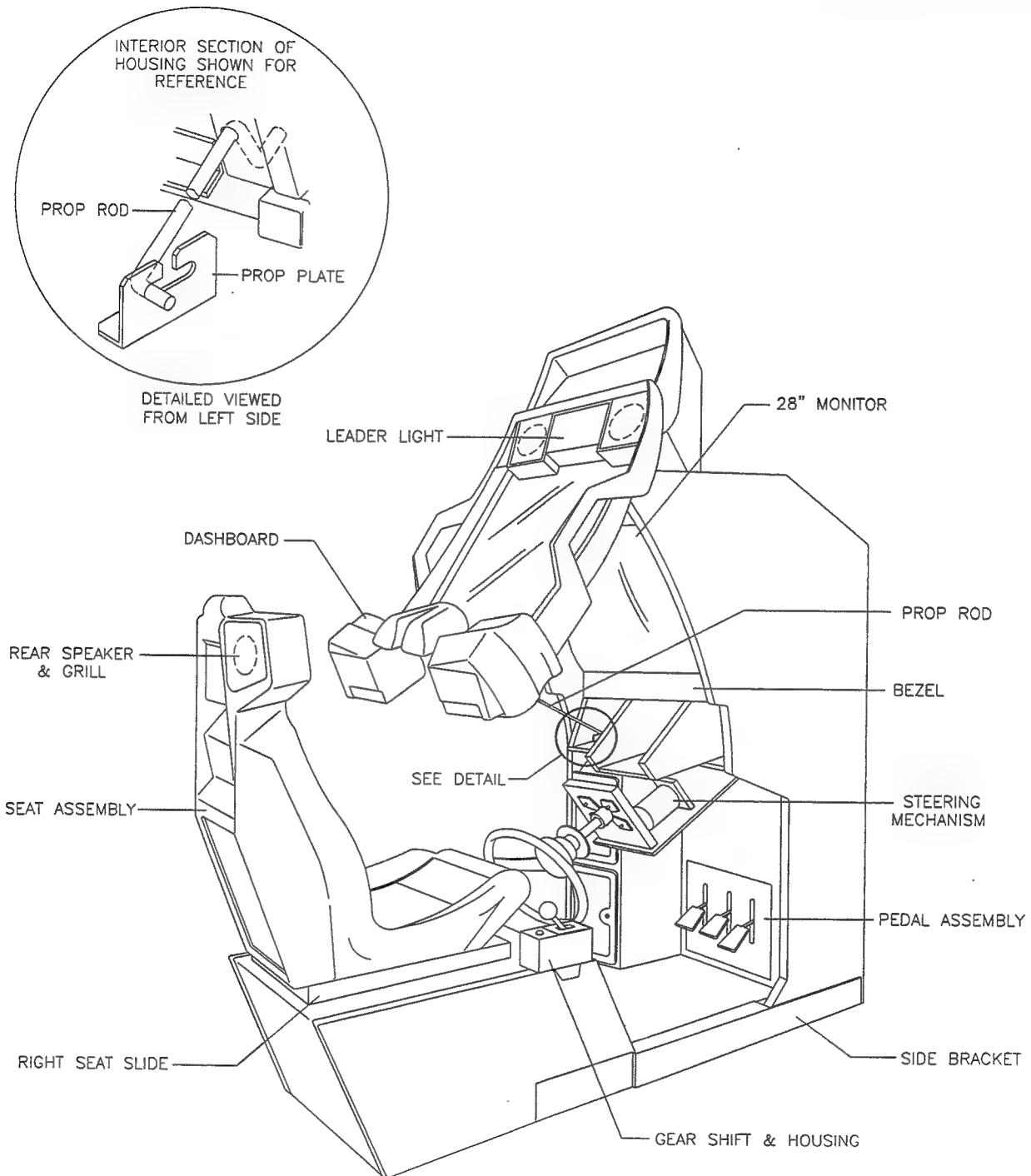
Switch off power to the game. Open the rear door. Disconnect pedal cable from wiring harness. Adjust the seat to the maximum rear position. Remove six outer mounting screws from pedal plate. Pull assembly toward seat and remove. Remember to recalibrate the pedals after installation.

### ◆ Steering Mechanism

Switch off power to the game. Adjust the seat to the maximum rear position. Remove the forward mounting screws under the dash on both sides. Place a support under the steering wheel so that it can not drop towards the floor. Remove the four outer mounting screws under the steering mechanism, but do not remove the inner mounting screws. Hold the steering wheel up while removing the support, then gently swing the mechanism down until it stops.

While the steering mechanism is exposed, inspect the belt. Install a new belt if the existing one is broken or shows signs of wear at the edges of the teeth. Loosen four mounting nuts for the steering wheel bearing. Tighten the tension adjust bolt only until there is no belt deflection, then loosen the bolt one full turn and tighten the four nuts. Reattach the mechanism and recalibrate the steering wheel.

## CABINET ASSEMBLY VIEW 2



#### ◆ **Dashboard**

Switch off power to the game. Remove the forward mounting screws under the dash on both sides. Support the steering wheel. Remove the outer mounting screws and lower the steering mechanism. Gently pull out on the bottom of the dash and swing it towards the seat, freeing the wiring harnesses along the way. Remove the free end of the prop rod from the retainer (behind the ABORT button) and swing it down until it rests in the rod bracket. Lower the dash until the prop rod supports its weight.

To return the dashboard to its normal position, support the dash and remove the prop rod from the bracket. Swing the rod up parallel to the floor and snap it into the retainer. Slowly lower the dash until it rests on the cabinet. Do not let the dash slam down onto the housing. Inspect for binding or pinched wires before reinstalling the cables, steering mechanism and the dash mounting screws.

#### ◆ **Dashboard Switches** *All switch buttons are dimly illuminated whenever the game is on. Do not substitute brighter light bulbs. The higher heat can cause the buttons to bind or stick.*

Switch off power to the game. Open the rear door. Disconnect all dashboard cables. Remove the dash mounting screws and prop the dash open. Unscrew the switch mounting nut and pull switch out from the front of the dash. Depress snap locks to separate the switch assembly from pushbutton or to expose light bulb. Refer to the Cabinet Wiring Diagram (Section Three) for wiring information.

#### ◆ **Speakers** *The dashboard speakers are magnetically shielded. Do not use unshielded units.*

Switch off power to the game. Always remove the upper mounting screws first and replace them last. The small speakers are mounted on their grills; the large speaker attaches directly to the back of the seat. Disconnect the wiring before removing the speakers from the enclosure. Speaker phase is important (refer to the Cabinet Wiring Diagram in Section Three for speaker wiring information). Do not use excess force when removing or tightening mounting screws threaded into plastic.

#### ◆ **Leader Light** *This light bulb is dimly illuminated whenever the game is on.*

Switch off power to the game. Remove the screws from the Leader Light. Lift the clear cover panel and decal from the game. Push and turn to remove bulb. Clean bulb and cover before reinstalling.

#### ◆ **Marquee**

Switch off power to the game. Remove the screws from the marquee. Lift the clear cover panel and the marquee artwork from the game and set in a safe place. Clean the cover before reinstalling.

#### ◆ **Fluorescent Light Assembly** *This bulb is brightly illuminated whenever the game is on.*

Switch off power to the game. Remove marquee panel and game artwork. Remove both lamp locks. Grasp the bulb at both ends and give it a quarter turn. Gently pull the bulb straight out from its sockets. The starter also requires a quarter turn for removal. Do not force the bulb or starter during reinstallation. Clean the bulb to remove fingerprints and dust, then reinstall lamp locks and marquee.

To remove the entire light fixture, remove the lamp locks and bulb. Disconnect the fluorescent light assembly connector from its power cable. Squeeze sides of fixture slightly to release the snap locks, then pull off the cover. Remove the mounting screws, then lift out the assembly. The ballast is inside.

### **!! WARNING !!**

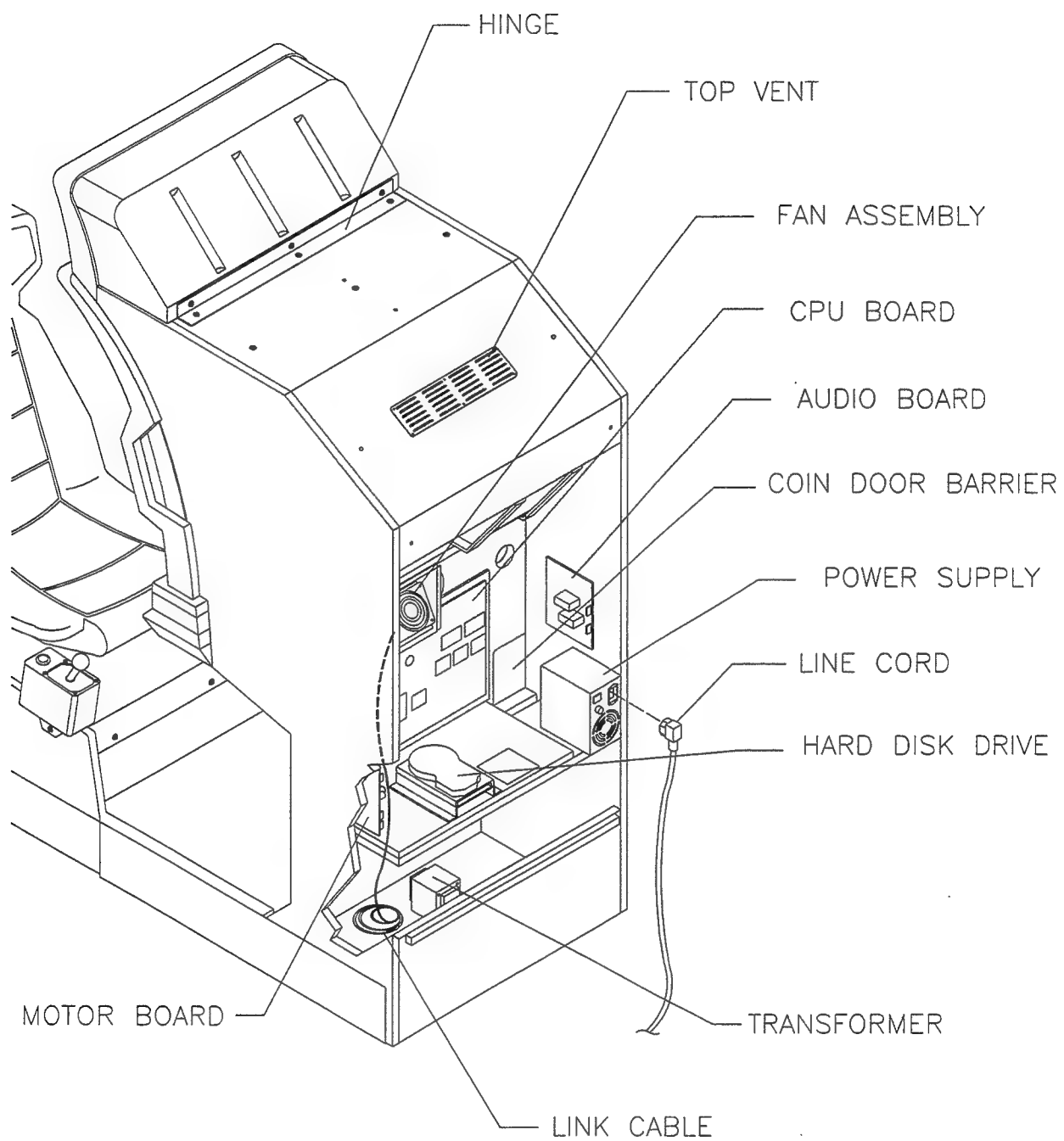
**If you drop a fluorescent tube or a CRT and it breaks, it will implode! Use care in handling.**

#### ◆ **Link Cable**

Switch off power to the game. Open the rear door. Depress the tab and remove the link cable modular plug from the CPU Board jack. Remove the cable clamps and lift cable from cabinet.

Return the linking cable to its original position in the cabinet if it is not connected to other games.

### CABINET ASSEMBLY VIEW 3



### ◆ Coin Counter

Switch off power to the game. Unlock the cash door and swing it open. The meter is located at the lower right corner of the door opening. Record the meter count before testing or replacement.

Insert a finger through access hole and locate the meter wires. Disconnect wiring at the connector. Remove the screws from the front. Ensure that replacement unit has a voltage suppression diode.

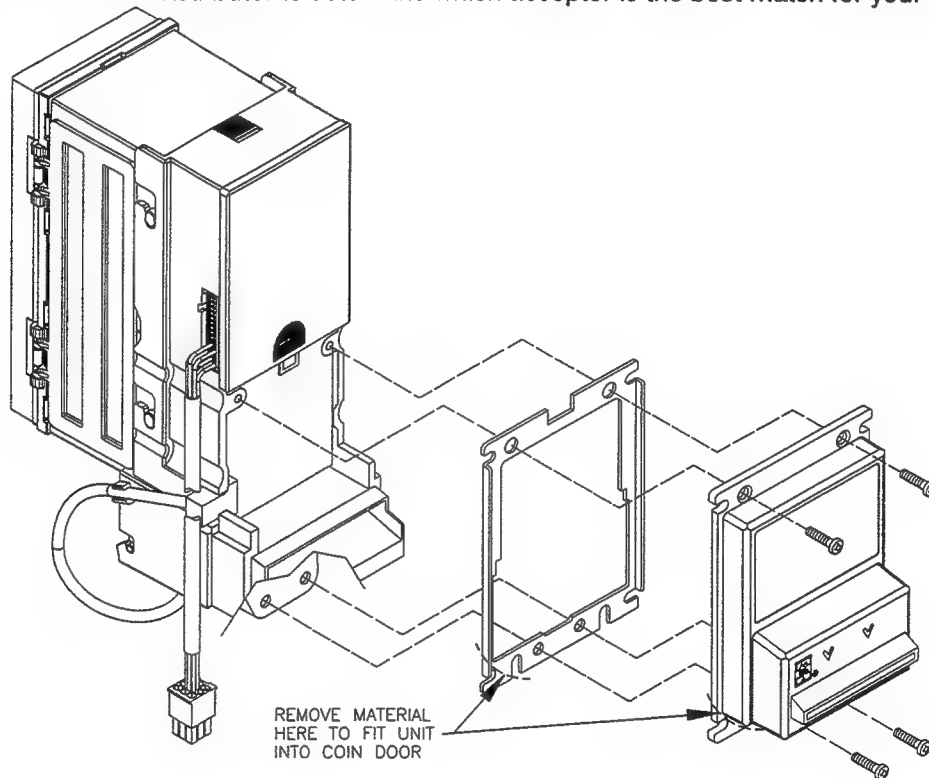
### ◆ Coin Mechanism

Switch off power to the game. Unlock the coin door and swing it open. Unlatch and remove each coin mechanism separately to clean or replace with a different type. Ensure that mechanism seats fully in the holder upon reinstallation. Close and lock the release latch, then close the door. Turn on the game and change the mechanism setup, then test known good and bad coins to verify operation.

### ◆ Dollar Bill Validator

(Use MARS AE2411-U3 or other U.L. Recognized currency changer)

Electronic currency acceptors may be installed in games that were manufactured with the additional wiring connector ("DBV or ECA Ready"). Switch off power to the game and unplug the A.C. line cord. Unlock the coin door and swing it open. Read door label for additional information. Disassemble the validator and remove material to permit fit inside the coin door as illustrated, then reassemble the unit. Contact your authorized distributor to determine which acceptor is the best match for your coin door.



Remove nuts, spacers, and cover plate from the door. Change switch settings or make adjustments before mounting the unit. If the manufacturer has supplied an adapter plate, place it over the door cutout at this time. Install spacers on threaded studs, then align the validator mounting holes with the studs and seat the unit in the door opening. Install the nuts and tighten firmly. Attach the ground wire (green with yellow stripe) lug to the door ground stud next to the hinge. Mate the wiring harnesses and press to fully seat connectors. Route wires away from door edges and hinge. Inspect for proper bill chute alignment. Plug in the line cord and turn on the game. Change the mechanism setup and pricing, then test known good and bad bills to verify proper operation. Close and lock the coin door when correct. Reverse these steps to remove a validator for service or replacement.

### ◆ Viewing Glass

Switch off power to the game. Open the dashboard. Loosen the mounting screws and slide the glass retainer from the bottom of the glass. Carefully slide the glass toward the steering wheel, then lift clear of the cabinet and set in a safe place. Clean the glass before reinstalling.

### ◆ Monitor

Switch off power to the game. Open the rear door. Disconnect all monitor and dashboard cables. Open steering mechanism and dashboard. Remove dashboard hinge screws and set the dash aside. Remove the monitor bezel and both barrier panels. Support the monitor from the front so it does not slip and remove the flange nuts securing the monitor's mounting brackets. Pull the monitor carefully from the cabinet and set in a safe place. Clean the face of the CRT before reinstalling the bezel.



## CAUTION

***THE VIDEO MONITOR IS HEAVY, WITH MOST OF THE WEIGHT TOWARD THE FRONT OF THE ASSEMBLY. BE SURE IT IS FIRMLY SUPPORTED AS IT IS REMOVED FROM THE CABINET.***

***The monitor does not require isolation from the A.C. line voltage in normal operation. However, when operating outside the cabinet or servicing the monitor on a test bench, YOU MUST ISOLATE THE MONITOR FROM LINE VOLTAGE WITH AN ISOLATION TRANSFORMER.***

### ◆ Hard Disk Drive

***REMEMBER: HARD DISK DRIVES ARE FRAGILE***

**Use an anti-static bag and approved shipping container (P/N 08-8068) to return the hard disk drive assembly to your distributor.**

Switch off power to the game. Open the rear door. Disconnect the D.C. power cable from the drive. Remove the screws from the sides of the drive mounting bracket. Unplug the ribbon cable from the hard drive and leave it attached to the CPU board. Remove screws and lift out hard disk drive assembly. Store or transport the drive in its shipping container. *Do not stack or drop hard disk drives.*

### ◆ Power Supply

Switch off power to the game and disconnect the line cord. Open the rear door. Unplug the A.C. power connectors from the top and rear of the supply. Disconnect the D.C. power cables from the Hard Disk Drive and the game wiring harnesses. Do not remove the supply mounting bracket. Remove two rear screws attaching the power supply to the cabinet. Slide supply out of the bracket. Verify the line voltage setting and the fuse rating before reinstalling or replacing the power supply.

### ◆ Transformer

Switch off power to the game and disconnect the line cord. Open the rear door. The Transformer is located under the electronics shelf and behind the pedal assembly. Note the positions of the wires before disconnecting them. Remove the mounting screws and lift the transformer out of the cabinet.

NOTE: Some units use an additional autotransformer to adapt this game to other line voltages. Refer to the Power Wiring Diagram in Section Three for autotransformer connections.

### ◆ Cooling Fan

Switch off power to the game and disconnect the line cord. Open the rear door. Clean the fan to prevent dirt from falling onto electronic components. Disconnect the power cord from the fan terminals and remove the ground wire. Remove mounting screws and lift the fan out of the cabinet. Ensure that the air flow is toward the motor board heatsinks when reinstalling the fan.

### ◆ CPU Board Assembly

Switch off power to the game. Remove the cabinet rear door. Carefully note the orientation of the JAMMA connector and the other cables of the wiring harness. Extract the harness cables, D.C. power cable, and the hard disk drive ribbon cable from the board connectors. Remove the CPU Board Assembly mounting screws. Lift the board out of the cabinet and set in a safe place. Anti-static bags and protective containers from new parts may be used to store the board if it is not reinstalled.

### ◆ Audio Board Assembly

Switch off power to the game. Remove the cabinet rear door. Carefully note the orientation of the cables of the wiring harness. Extract the harness cables from the board connectors. Remove the board mounting screws and the spacers. Lift the board out of the cabinet and set in a safe place. Anti-static bags and containers from new parts may be used to store the board if it is not reinstalled.

### ◆ Motor Board Assembly

Switch off power to the game. Remove the cabinet rear door. Carefully note the orientation of the cables of the wiring harness. Extract the harness cables from the board connectors. Remove the board mounting screws and the spacers. Lift the board out of the cabinet and set in a safe place. Anti-static bags and containers from new parts may be used to store the board if it is not reinstalled.



**CAUTION** *Allow adequate time for cooling before handling board. Heatsink and power resistors may get very hot during normal operation.*

### ◆ Memory Replacement

The ROM (Read Only Memory) circuits contain the computer operating instructions. *Memory devices are especially sensitive to static charges. Use grounding precautions when handling these parts.*

Switch off power to the game. Carefully note the position, then remove using a chip extraction tool.

To reinstall memory circuits, orient a chip over its socket and press firmly to seat pins. *Do not force.*



**CAUTION** *Discharge any static electricity build up in your body by touching the power supply chassis. This is to be done BEFORE touching or handling the electronic assemblies.*

### ◆ Battery

Switch off power to the game. Carefully note the position, then gently lift the contact arm to release tension. *Do not bend the arm.* Slight finger pressure may be needed to pry the cell from its holder.

To reinstall the battery, orient cell near its holder and slide it in under the contact arm. *Do not force.*



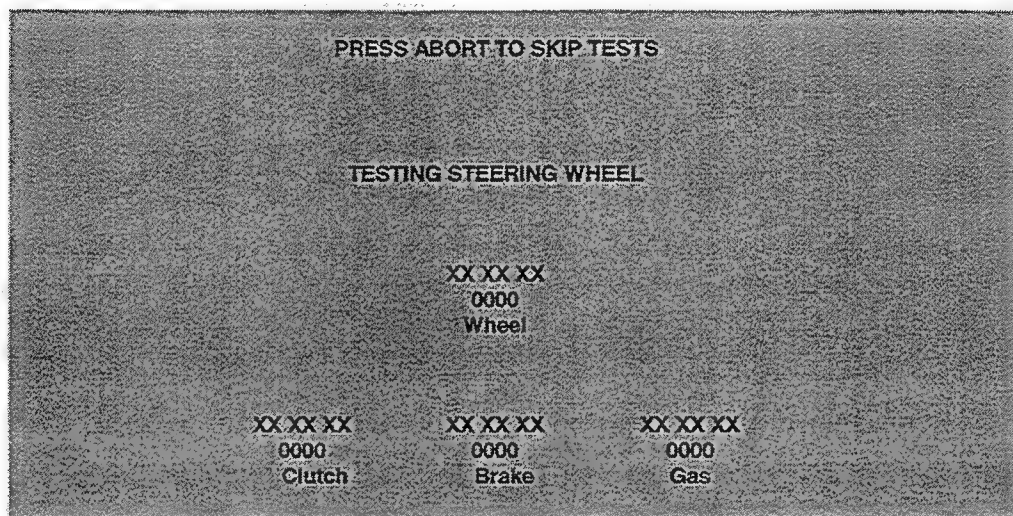
**CAUTION** *Danger of explosion if battery is incorrectly installed. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to instructions printed on the battery or on the manufacturers packaging.*

NOTE: *To avoid explosion, all replacement batteries must match the original in size, voltage rating, and composition. Manufacturer recommended equivalent types are acceptable. These batteries are designed for very long life. Do not attempt to recharge these batteries! Avoid direct shorts across terminals or from terminals to ground. Remove them from their holders and store in a safe place until repairs have been completed. Dispose of used batteries according to the manufacturer's instructions.*

## POWER ON TESTS

The Power On Tests let the game calibrate the player controls. ***Do not touch the wheel during test.***

These basic tests run automatically; their purpose is to detect those faults that would prevent the game or the menu system from operating properly. Steering wheel and pedal positions are checked for position and function. Messages appear on screen as each item is run, along with any errors detected.



**POWER ON TESTS SCREEN**

The test routine runs whenever power is switched off and on or in cases where there is a processor reset. This prevents system calibration errors to the critical player controls.

A successful self-test takes less than one minute to complete. Write down any messages before proceeding to menus or game play. Players can override this screen, but performance may be reduced.

After the above screen is displayed, the system will turn the steering wheel to each of its extremes and indicate the maximum and minimum position values. Dirt, debris, binding, or loose parts may cause errors to be detected by this routine. The calibration routine takes less than 10 seconds to complete.

*Do not touch the wheel or pedals during the automatic portion of this calibration routine.* If the self-test has determined that the pedals are not set correctly, on screen messages will direct you to press and release each of the pedals to set the travel limits. These new values will be stored in memory.

Errors may be diagnosed more thoroughly by manual testing (refer to CONTROLS TEST in this section).

Use the ABORT button to cancel these tests. Allow the tests to complete at least once before aborting. *The ABORT function will start the game, but players may not be able to control the cars if faults exist.*

During service or repair, power may be disconnected and restored repeatedly. Each break in power will cause these tests to be run again. After the first time, you may press ABORT to skip any unwanted tests.

**NOTE:** When the games are linked, a car color error message may appear during or after the Power On Tests screen. It is mandatory that each game must have a different car color selected. Refer to the TOURNAMENT OPTIONS screen later in this section if changes are required.

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## GAME OPERATION

### INITIAL START UP

When the game is first turned on, power is restored, or a reset occurs, it executes the boot ROM code. Automatic self-diagnostic tests verify and report condition of the hardware, memory, hard disk drive, etc. If any of the individual tests fails, then an error message will be displayed for that particular test. Record all messages before starting a game. The message will be displayed until the ABORT button is pressed.

- \* If no buttons are pressed, the system will quickly complete all tests then load and run the game.
- \* Press and hold the coin door TEST button to skip the boot ROM tests and activate the Menu System.

Once Power-up tests have been completed, the game goes into ATTRACT MODE. Scenes and sounds from a typical game are alternated with previous track times in endless repetition until game play starts.

### ATTRACT MODE

Before the game starts, the ATTRACT screens show scenes and sounds from typical races on each of the tracks. Alternating with these scenes are views of the cars, best track times, game production team acknowledgements, etc. The attraction screens cycle endlessly until a player or operator starts the game.

The operator can choose to add more ATTRACT screens to the standard presentation, if desired.

- ◆ The "WIN RACE FOR A FREE GAME" message will display in the ATTRACT MODE if Free Game setting is chosen (refer to the adjustment screen for GAME DIFFICULTY later in this section).
- ◆ The "ASK ATTENDANT ABOUT RUSH TOURNAMENT" message will display if the TOURNAMENT SETUP MESSAGE setting is chosen (refer to TOURNAMENT OPTIONS later in this section).

### TEST MODE

The operator may enter the menu system at any time to analyze the game or adjust it if required.

**NOTE: Do not enter the Test Mode with other linked games in progress. This may halt games.**

### GAME RULES

#### INDIVIDUAL PLAY (STAND ALONE OPERATION)

Choose any cabinet\*. Insert currency to start the game. Player selects from the required game variables:

1. The player selects a track. Each track has a different skill level and quantity of checkpoints.
2. The player selects from several cars. Each car has different handling capabilities.
3. The player selects automatic transmission (no shifts) or manual transmission (clutch optional).

#### HEAD TO HEAD PLAY (LINKED OPERATION)

Choose a linked cabinet\*. Insert currency at JOIN IN message. There are now some restricted choices:

1. The players select tracks. All tracks are available, but all players must choose the same track.
2. The players select from several car types and colors. Players may choose identical types if desired.
3. The players select automatic transmission (no shifts) or manual transmission (clutch use is optional).

#### ELIMINATION CONTESTS (TOURNAMENT PLAY)

Choose a tournament cabinet\*. Payment and restrictions are controlled by the operator or attendant.

1. Track is selected in advance or by remote control. Players must use the same track during a contest.
2. Vehicles are chosen. The operator may intentionally limit the range of player choices if desired.
3. Transmission type can be fixed for each tournament or at player discretion. Remote start is possible.

\*NOTE: Players may use the SOLO option during track selection to decline a linked or tournament race.

## GAME FEATURES

### PREVIEW

In the ATTRACT mode, the game automatically cycles through scenes and sounds from typical races. Tap the MUSIC button during any of these scenes to skip ahead, or press and hold MUSIC to continue a view of that particular track. Players will be presented with laps seen from several different camera angles and driver viewpoints. Use this feature to see some of the fast grooves for curves, tunnels, jumps, etc.

The Preview feature may also be used as a demonstration of each of the tracks in the game. This allows players to decide which track is best suited to their needs when considering head-to head competition.

### TRACKS

Each track requires different skill level. As more challenging tracks are selected, the course difficulty automatically increases. This forces players to maintain higher speeds and make fewer errors to continue racing. Press the VIEW 1 button during track selection for mirror effect (left/right images reversed).

If games have been connected together in a network, players will choose to accept or decline a race against other players from this screen. A JOIN IN message is illuminated when this type of competition is possible, and a LINKING message alerts other players when they get to their track selection screen.

### SOLO

Press and hold the shifter REVERSE button during track selection to eliminate other cars from the course. This allows players to learn the track without interference from human or computer controlled cars. Solo races may also be used for qualification runs and time trials prior to linked race or tournament competition.

### CARS

Players may choose from four basic car types: Beginner, Advanced, Expert, or Extreme. As the cars are viewed, bar graphs on the selection screen show relative speed and control characteristics of each type. Tap the VIEW 1 button during car selection to cycle through the additional vehicles available.

Cars may be modified while the car selection screen is active. Press and hold the MUSIC button to display the player adjustable features. Press the VIEW buttons to cycle through the settings available for each feature. Steering Wheel Force changes the amount of road feel (feedback) and the effort required to turn the vehicle. Selecting No Drones removes the computer controlled cars from the track.

Car bodies can be set to any one of several colors. Car color can not be changed during a race. Players do not have the ability to choose their own car color, but the operator can select colors from the menu screen. The color is used in the game to identify individual players and keep track of their positions during competition. NOTE: For Linked or Tournament races, each cabinet must be set to a different car color.

### SHIFTER

Players may choose between automatic and manual transmissions. Manual shifting usually produces better speed control, resulting in faster lap times. The operator may set all the games to a fixed shift type if players agree or a particular style of competition requires this feature.

### RACE LENGTH

Several things affect the length of a race. Difficult tracks have more turns and speed changes between start and finish lines. Each checkpoint requires a certain minimum speed to continue racing. Players pick up bonus time as each checkpoint is passed. Skilled players can earn extra laps before the race ends.

### ADDED FEATURES

To keep things interesting, there are extra rewards for those brave enough to experiment. Drivers who don't stick to the marked course will find short cuts and alternate routes to the checkered flag. There are a number of side trips to take over, under, around, and through the race course. Tap the ABORT button to return to the course if you crash and burn, so don't be afraid to investigate.

## PLAYER CONTROLS

### ◆ VIEW 1 Button

The VIEW 1 button permits players to see the course from the front of the car during a race. Press and hold the VIEW 1 button during the selection screens to see additional tracks and car styles.

### ◆ VIEW 2 Button

The VIEW 2 button allows players to see the roadway from inside the car (normal driver viewpoint). Press MUSIC and VIEW 2 together during car selection to remove all drone cars from the track.

### ◆ VIEW 3 Button

The VIEW 3 button gives an aerial view. Players see the whole area from above and behind the car. Press MUSIC and VIEW 3 together during car selection to modify steering wheel force values.

### ◆ MUSIC Button

The MUSIC button changes the tunes heard during the game. Tap to turn off or get another station. Press MUSIC in combination with the VIEW buttons during car selection to display more options.

### ◆ ABORT Button

The ABORT button allows immediate game play interruption. The car recovers from fatal mistakes. Press ABORT to return to the road and continue. This button keeps players in the competition.

### ◆ REVERSE Button

Press the REVERSE button at any time to change the direction of the drive wheels rotation. Press REVERSE during track selection for SOLO race to eliminate linking and decline a tournament).

### ◆ GEARSHIFT

The GEARSHIFT allows the player to select the best gear for acceleration, cruising, or deceleration. The GEARSHIFT does not function during the race if automatic transmission has been selected.

### ◆ SEAT ADJUSTER

Pull the SEAT ADJUSTER lever to the left until the seat moves freely, then slide the seat as required. Release lever and rock back and forth slightly to engage a detent position. This locks the seat location.

### ◆ GAS Pedal

The GAS pedal is used to control the car speed during the race. The same pedal is used to select car track, style, transmission type, etc., during game setup.

### ◆ BRAKE Pedal

The BRAKE pedal is used to slow or stop the car during the race. Heavy braking may affect a player's ability to steer the car in turns or sudden maneuvers.

### ◆ CLUTCH Pedal

The CLUTCH pedal is used for manual gear change. It has no function if automatic transmission is used. The manual transmission has synchronous gears to permit shifts without using the clutch if desired.

### ◆ STEERING WHEEL\*

The STEERING WHEEL is used to aim the car during the race. It provides road feedback to the player. The Wheel is also used to choose car track, style, transmission type, etc., during game setup.

\*NOTE: Players can adjust the Steering Wheel Force to suit their driving style. After choosing a track and car type, press and hold the MUSIC button. The force adjust window will appear on the car selection screen. Press the VIEW 3 button to cycle through the settings available for this feature, then choose a force level. The new setting will be confirmed on the shift selection screen just before the race starts.

## OPERATOR CONTROLS

### ◆ POWER SWITCH

The POWER SWITCH (on the Power Supply) turns off the game. It does not reset the game setup.

### ◆ RESET SWITCH

The RESET SWITCH (on the CPU Board) restarts the game during service. It does not reset setup. Use the RESET SWITCH to observe the CPU LED indicators while the game is starting up or linking.

### ◆ SLAM SWITCH

The SLAM SWITCH (on the Coin Door) prevents game abuses like pounding to obtain free games.

### ◆ COIN DOOR SWITCHES

The VOLUME DOWN and VOLUME UP button switches increase or decrease game sound levels. The TEST MODE button switch enters the menu system to allow operator custom settings or tests. The SERVICE CREDIT button switch allots credits without changing the game's bookkeeping total.

### ◆ MONITOR REMOTE ADJUSTMENTS

The MONITOR REMOTE ADJUSTMENTS (behind coin door) set video display for optimum viewing.

### ◆ DASHBOARD SWITCHES

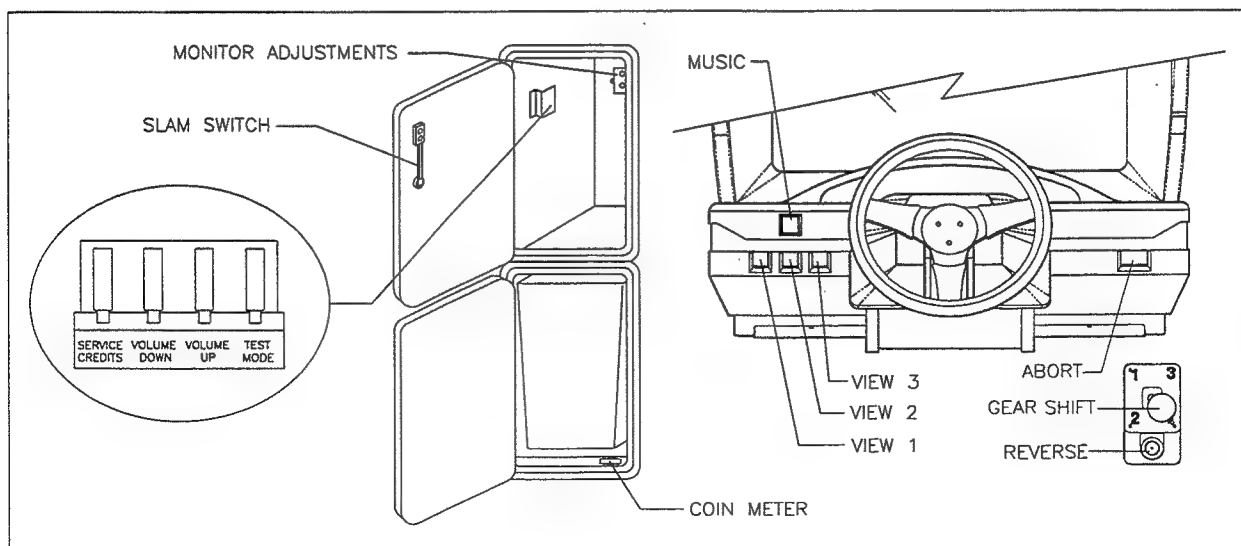
MUSIC, VIEW, and ABORT are used to move through the menu system and make changes, reset factory defaults, run tests, etc. Their functions are described by information on each menu screen.

### ◆ GEAR SHIFT SWITCHES

The GEAR SHIFT is used to test various game indicator lights (refer to CONTROLS TEST screen). The REVERSE button functions are described by information on each menu screen.

**NOTE:** The dashboard buttons are lighted, and for some of the menu screens the lights illuminate brightly to indicate which of the buttons are active. The coin door buttons have no indicator lights. Use of the dash buttons is preferred over coin door buttons for this reason.

*The coin door must be open to reach SLAM, SERVICE CREDIT, TEST MODE, or VOLUME switches.*



**FRONT CONTROL SWITCH LOCATIONS**

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# MENU SYSTEM

## SYSTEM OVERVIEW

Game variables and diagnostics are presented in a series of on-screen menus. The Main Menu screen allows the operator to view information, make changes, or verify equipment operation. Each Sub Menu screen displays one specific group of choices. The Detail Menu presents data or runs the required test. You must be at the Detail Menu level to detect errors, make changes, or activate tests. Both the operator controls and the player controls are used to move through the menus and start or stop particular routines.

## SCREEN LAYOUT

Each menu screen is different, but the material presented stays in the same physical location each time.

The color bar at the top center of each screen displays the current menu title.

The center of the screen is used for data (menu items, video signals, statistics, reports, etc.)

The bottom of the screen is reserved for messages (control functions, revision levels, etc.)

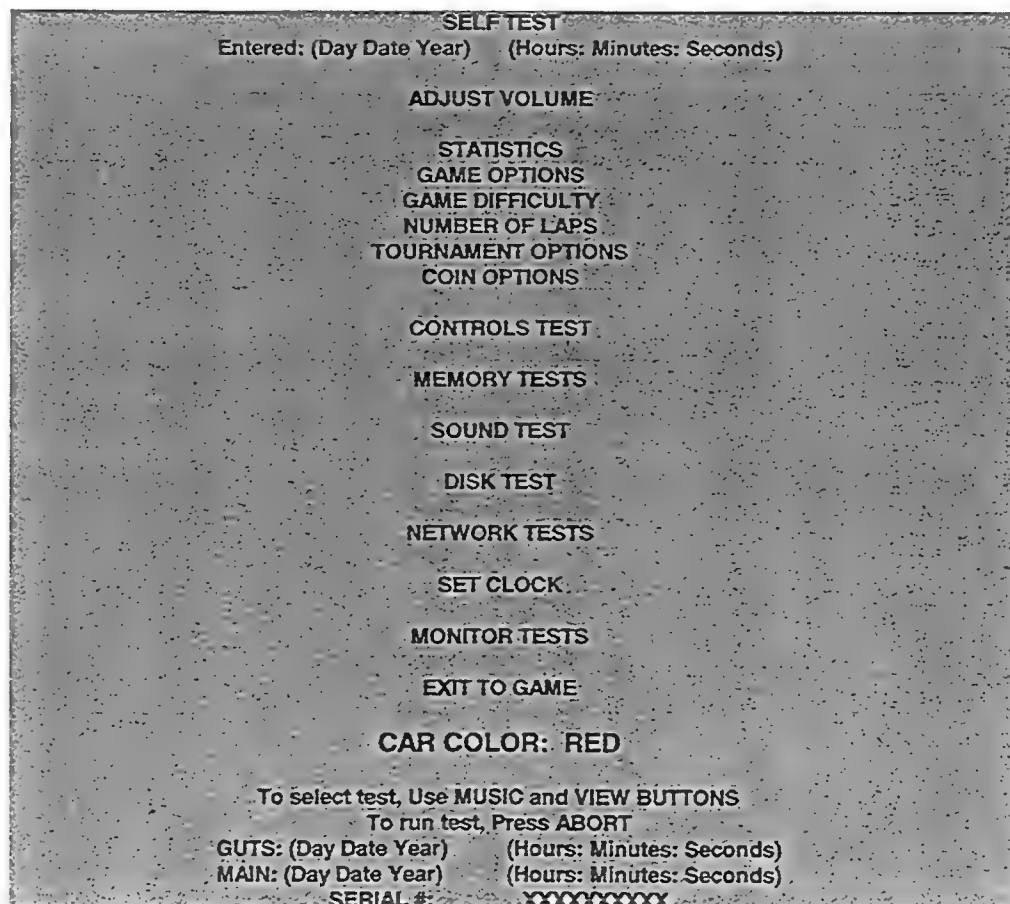
## ORGANIZATION

Main Menu screen items fall into two categories: options and tests. Items must be activated manually.

Sub Menu screen items offer the operator choices within a category. Some items have no Sub Menu while others may have more than one. You can get back to the previous menu or go on to the next menu.

Detail Menu screen items contain specific information. The operator must interact with the system to get results or to make changes. There is always a way to go back to the previous menus from this screen.

Use the control indicated to highlight an item on any menu. Only one highlighted item can be selected at a time. To return the game to normal, select EXIT TO GAME, then press the indicated button.



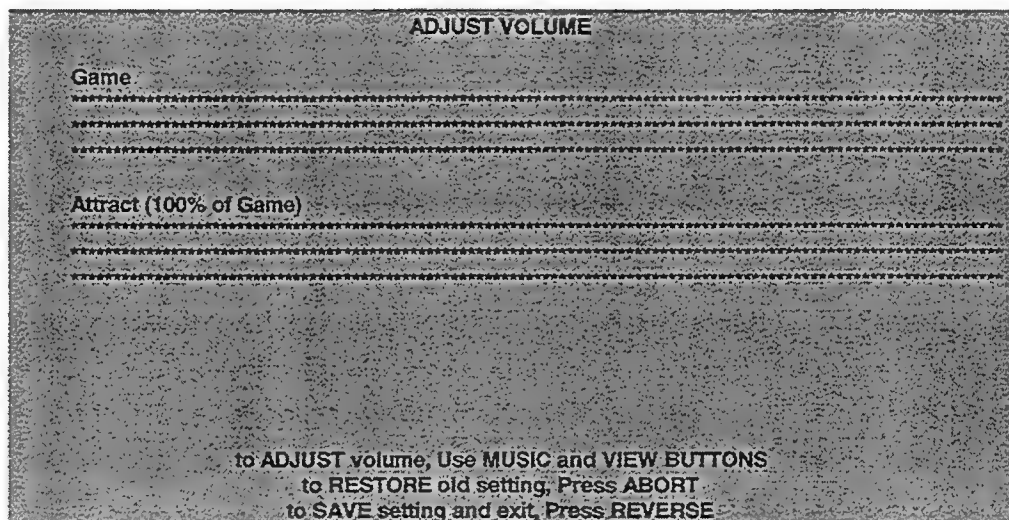
TYPICAL SELF TEST MENU SCREEN

## ADJUST VOLUME

The Adjust Volume feature allows the operator to determine the sound and music levels of the game.

The volume level can be adjusted for either the Attract Mode or the Game. Press MUSIC to choose Game Volume or VIEW 2 for Attract Volume. Press the VIEW 1 button to lower the volume level or the VIEW 3 button to raise the volume level. Music is played continuously while this screen is active.

Game Volume level may be adjusted without going through the menu system. Open the coin door and use the VOLUME UP and VOLUME DOWN buttons of the Coin Door Switches during a game or when in attract mode.



### ADJUST VOLUME MENU SCREEN

The "Game" volume is continuously adjustable from zero to maximum. The game will seem more realistic if the player experiences high volume sounds during play (performance cars are not quiet in operation).

The "Attract" volume only has four levels of adjustment: Mute (zero), 1/3, 2/3, or Full (same as the "Game" setting). For greater profits, adjust your volume levels to a loud setting to draw attention to this game.

The current volume level is represented by the length of a bar made of asterisks. A longer bar indicates a higher volume setting than a short bar. Factory default for "Game" volume levels is 7, "Attract" 2/3.

The "Attract" and "Game" volume levels may be adjusted to different values, but the "Attract" level cannot be set higher than the level chosen for normal game play. If the "Game" level is lowered, it will automatically lower the "Attract" level. Lowering the "Attract" level will not effect the "Game" volume.

During a game, both music and sounds are present. Players can tap the MUSIC button to select several different tunes or turn off the music, but sounds are always present. Players can not change the volume.

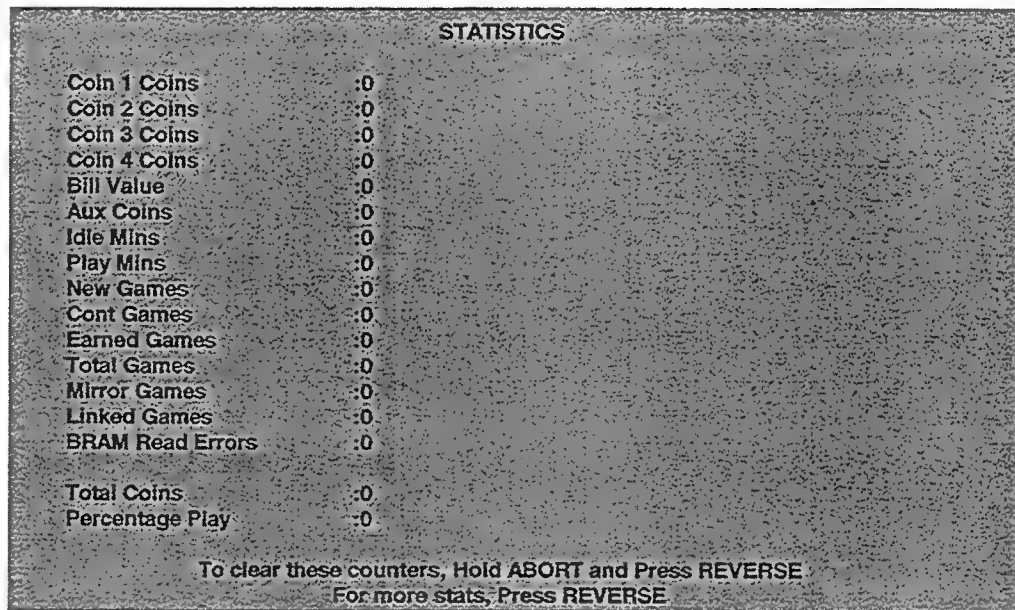
Be certain to press only the REVERSE button when any volume adjustments are made. The ABORT button will cancel any settings on the screen and return both levels to the previous screen values.

**NOTE:** These adjustments affect the volume of the sound tests as well as the game play. If the volume levels are set to minimum (zero), there will be no sounds from the speakers during any of the audio tests. It is recommended that the volume levels be set to a moderately high value each time the sound electronic components or speakers of the game are checked. The levels may be returned to their previous settings after the tests have been completed.

## STATISTICS

The Statistics report allows the operator to assess how often and how well the game is being played. In addition to the earnings, various game aspects are tracked to determine the player skill levels.

Use the MUSIC and VIEW #2 buttons to select a particular menu item. The statistics may be reset to zero or allowed to increase after each viewing.



Coin 1 Coins	:0
Coin 2 Coins	:0
Coin 3 Coins	:0
Coin 4 Coins	:0
Bill Value	:0
Aux Coins	:0
Idle Mins	:0
Play Mins	:0
New Games	:0
Cont Games	:0
Earned Games	:0
Total Games	:0
Mirror Games	:0
Linked Games	:0
BRAM Read Errors	:0
Total Coins	:0
Percentage Play	:0

To clear these counters, Hold ABORT and Press REVERSE  
For more stats, Press REVERSE

### STATISTICS REPORT MENU SCREEN

The illustration shows how the report screen will look after the game has been reset or is first turned on. Most of the statistics will increase in value as the game is played. It is normal for some values to remain at zero: for example, the Earned Games count will not change unless the cabinet has been set up for free games, and the Error count will not change if no errors have occurred.

Low counts in both coin and player statistics may indicate that the game is too difficult for the skill levels of the players at this location. High counts may result if Bonus or Winner Option menu items are in effect. The difficulty level and other play characteristics may be adjusted from the Game Options menu.

Press only the REVERSE button to view the additional game statistics. If the game has not been played before, or if the counters have been cleared, the additional statistics will not be present.

HISTOGRAMS allow graphical analysis of statistics. This permits visual comparisons between games. The HISTOGRAMS screens will have no bar graphs until the system has enough data to plot.

Note and record any user messages. These messages can be useful in detecting intermittent conditions. The USER MSGS screen will contain no messages until the system detects an error.

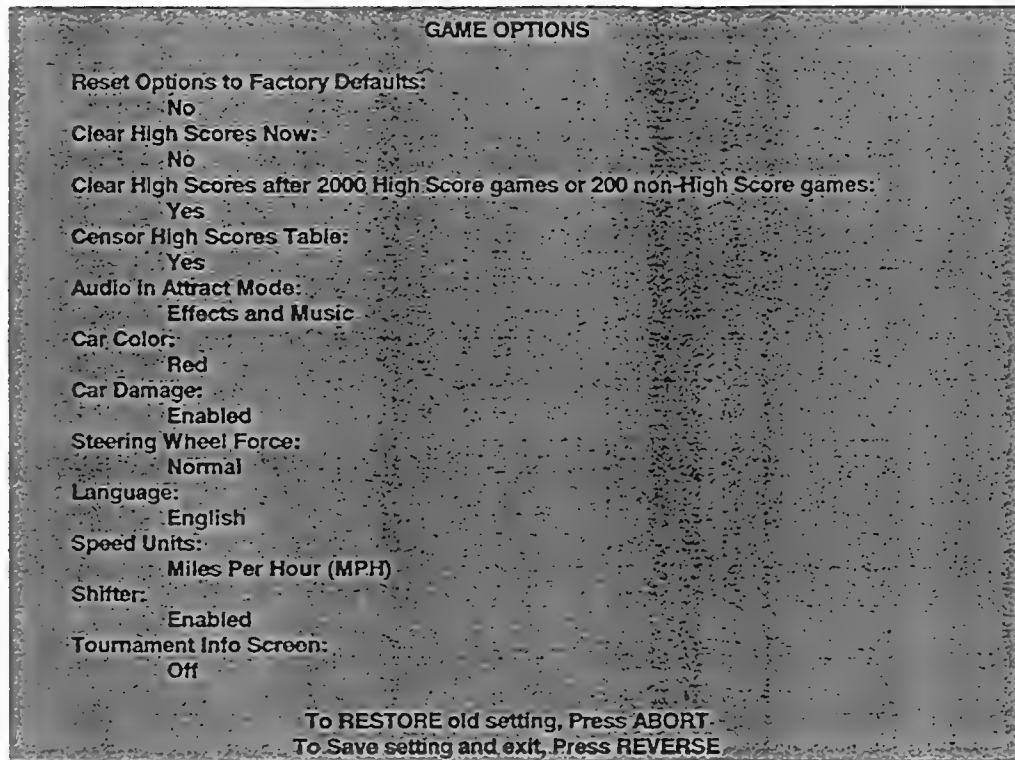
It is recommended that the Statistics be recorded before any service or repairs are done on this game.

Press REVERSE and ABORT together to cancel any changes on the screen and clear all counters to zero. **This deletes all Histograms and User Messages, so examine them before using this action.**

## GAME OPTIONS

These adjustments allow the operator to customize the game. Each of the variables will change some aspect of game appearance or play. Optimum settings cause high player interest and increase earnings.

Use the MUSIC and VIEW #2 buttons to select a particular menu item. The VIEW #1 and #3 buttons are used to change variables. Options may be reset to factory default values or changed after each viewing.



### GAME OPTIONS MENU SCREEN

The illustration shows how this screen will look with all of the factory default settings. Each press of the VIEW #1 or #3 buttons will advance a variable through its range of choices. Some items have more options than others. It is recommended that all of them be examined before one is selected.

The effects of these options can be judged by comparing statistics reports before and after changes were made. As players become more familiar with the game, you can add new features or increase difficulty.

*For Linked or Tournament races, each cabinet must be set to a different car color. The color is used in the game to identify individual vehicles and keep track of their positions during competition.*

Steering Wheel Force sets the game default value. Players may elect to change this to their particular requirements during car selection using the MUSIC and VIEW 3 buttons.

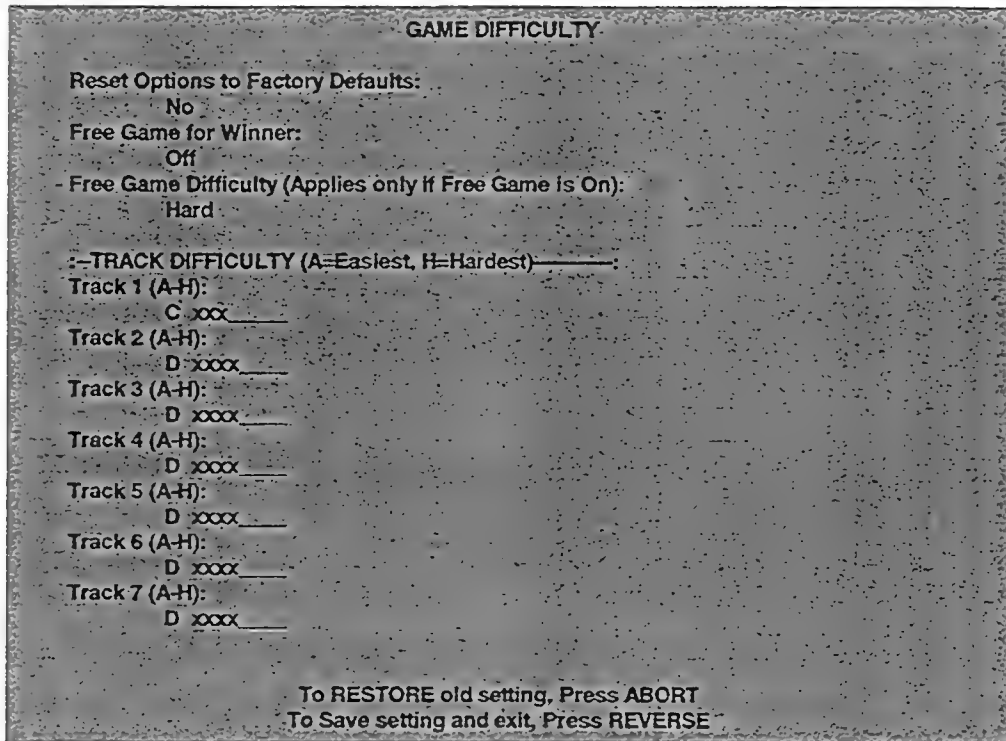
Language changes the player information during game play. It does not change menu screens or tests.

Turning ON Tournament Info Screen shows a player message "Ask attendant about RUSH tournament" in the "attract" mode. Operators can set up tournaments in advance and activate the message as needed. Refer to TOURNAMENT OPTIONS later in this section to determine the variables for tournament play.

## GAME DIFFICULTY

These adjustments allow the operator to set track attributes. Each of the variables will change some aspect of game play. Optimum settings cause high player interest and increase earnings.

Use the MUSIC and VIEW #2 buttons to select a particular menu item. The VIEW #1 and #3 buttons are used to change variables. Options may be reset to factory default values or changed after each viewing.



### GAME DIFFICULTY MENU SCREEN

The illustration shows how this screen will look with all of the factory default settings. Each press of the VIEW #1 or #3 buttons will advance a variable through its range of choices. Some items have more range of adjustment than others. It is recommended that all of them be examined before one is selected.

The effects of these items can be judged by comparing statistics reports before and after changes were made. As players become more familiar with the game, you can add new features or increase difficulty.

It is recommended that track settings be recorded before any service or repairs are done on this game.

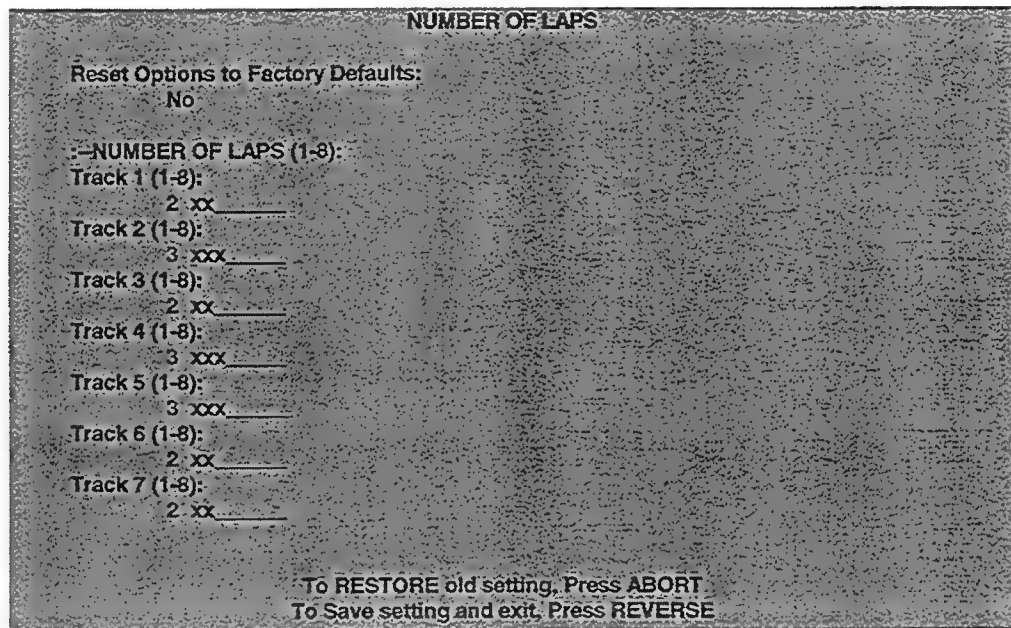
**FREE GAME** settings can be used to reward winning players. The free game difficulty adjustment is separate from the other difficulty settings in the game. Free game player incentives may reduce earnings.

**TRACK DIFFICULTY** determines how long each player can take to finish the course. As this gets harder, cars must maintain a higher average speed (less time) between checkpoints to stay in the running.

## NUMBER OF LAPS

These adjustments allow the operator to set the lap requirement for each track. Each of the variables will change some aspect of game play. Optimum settings cause high player interest and increase earnings.

Use the MUSIC and VIEW #2 buttons to select a particular menu item. The VIEW #1 and #3 buttons are used to change variables. Options may be reset to factory default values or changed after each viewing.



### LAP NUMBER MENU SCREEN

The illustration shows how this screen will look with all of the factory default settings. Each press of the VIEW #1 or #3 buttons will advance a variable through its range of choices. Some items have more range of adjustment than others. It is recommended that all of them be examined before one is selected.

The effects of these items can be judged by comparing statistics reports before and after changes were made. As players become more familiar with the game, you can add new features or increase difficulty.

It is recommended that lap settings be recorded before any service or repairs are done on this game.

**NUMBER OF LAPS** sets the total length of the race. Short races permit more players per hour on each game. When the skill levels rise, increase the number of laps as required to maintain player challenge.

## TOURNAMENT OPTIONS

These adjustments allow the operator to set up a tournament. Each of the variables will change some aspect of tournament races, but they will have no effect on normal game play.

Use the MUSIC and VIEW #2 buttons to select a particular menu item. The VIEW #1 and #3 buttons are used to change variables. Options may be reset to factory default values or changed after each viewing.



### TOURNAMENT MENU SCREEN

The illustration shows how this screen will look with all of the factory default settings. Each press of the VIEW #1 or #3 buttons will advance a variable through its range of choices. Some items have more range of adjustment than others. It is recommended that all of them be examined before one is selected.

The effects of these items can be judged by comparing statistics reports before and after changes were made. As players become more familiar with the game, you can add new features or increase difficulty.

**Atari Games Corporation does not represent, warrant, or guarantee that tournaments, contests, or competition involving the Rush The Rock game are legally permissible in your jurisdiction. The operator agrees that the Rush The Rock game will not be used in any manner that conflicts with federal, state, or local laws, and that the operator has used his or her best, good-faith efforts to demonstrate that the proposed use and operation of the Rush The Rock game and any promotional materials complies with all federal, state, and local laws and regulations.**

**SEND TOURNAMENT SETUP MESSAGES TO ALL CABINETS** lets the operator choose to alert all cabinets of changes only if they are made or even if they are not made. This controls network updates.

**CABINET** provides individual selection of the number of games set up for tournament or normal play. An operator may choose to reserve a few cabinets for players who do not wish to participate in a tournament.

**JOIN IN** determines which games are active in a tournament. ANY PLAYER sends a message to all other tournament cabinets during startup but leaves participation up to individual players. REMOTE BOX uses an external control box to send each cabinet a tournament message manually. REMOTE BOX – QUICK MODE permits operators to send the message from a single location to every cabinet at the same time.

**TRACK** sets which course is used for a competition. One track can be fixed for each tournament. REMOTE BOX permits track selection only from the external control box.

**CAR** fixes the car style to avoid giving advantages to players who pick the fastest or best handling car. The PLAYER CHOOSES setting leaves the selection of cars up to the tournament participants.

**SHIFTER** sets the transmission type. Select MANUAL shifts for players who have clutch experience. The AUTO setting forces automatic shifts. As before, PLAYER CHOOSES leaves shift choices to the players.

**LAPS** allows the operator to fix the course length. This permits the operator to shorten or lengthen races. Races can be from 1-99 laps. The NORMAL setting retains the default lap values chosen for each track.

**DRONES** are the cars controlled by the computer. Choose OFF to see only active players on the track. Selecting ON fixes the computer controlled car colors at gray to distinguish them from tournament players.

**CATCHUP** permits players to make mistakes and still win. OFF ensures realism (no second chances!). ON allows lagging cars to gain on the leader for a close finish. NORMAL retains standard game activity.

**NOTE:** *Default values (indicated as NORMAL or PLAYER CHOOSES) for this screen will require new operator or player choices each time another game is started. Choice of other values from this screen will override the previous operator and player settings. Select REMOTE BOX only to use the external control box. In this mode, games will not function without the optional box connected.*

## **TOURNAMENT EXAMPLE**

Several days prior to the tournament, post promotional material to let the players know about the event. Before the contests begin, turn on the Tournament Info Screen to direct questions to the attendant. At the appointed hour, the operator clears the area and selects the number of tournament cabinets. Rules are discussed and decisions are made concerning track, car color, difficulty level, laps, etc. The tournament may be started on a verbal command or remotely from the optional control box. Winners of the round are posted and losing contestants are eliminated from the next level of competition. As fewer contestants remain in the final races, unneeded cabinets may be returned to normal game play. At the end of the tournament, the Info Screen is turned off and cabinets returned to use in regular games. Winner names may be submitted to websites, newsletters, magazines, radio, TV, etc. as is appropriate.

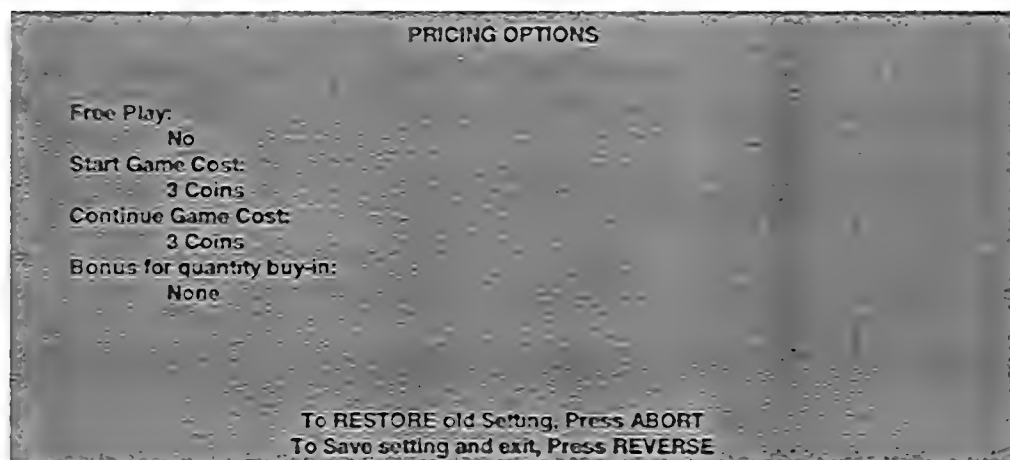
## **TOURNAMENT RULES**

Tournaments, contests and sweepstakes are heavily regulated, and laws vary from state to state. Most states require the posting of rules. Consult legal counsel prior to engaging in any prize promotion or tournament. Failure to comply with state regulations may result in criminal and civil liability. Neither Atari Games Corporation, nor its affiliates, agents or employees are responsible for the actions of any party using this game as part of a prize promotion, or tournament. Any attempt by any individual to state or imply that Atari Games Corporation, or affiliates, or their employees, approve of, authorize, sponsor, or co-sponsor any specific prize promotion or tournament will be prosecuted to the full extent of the law.

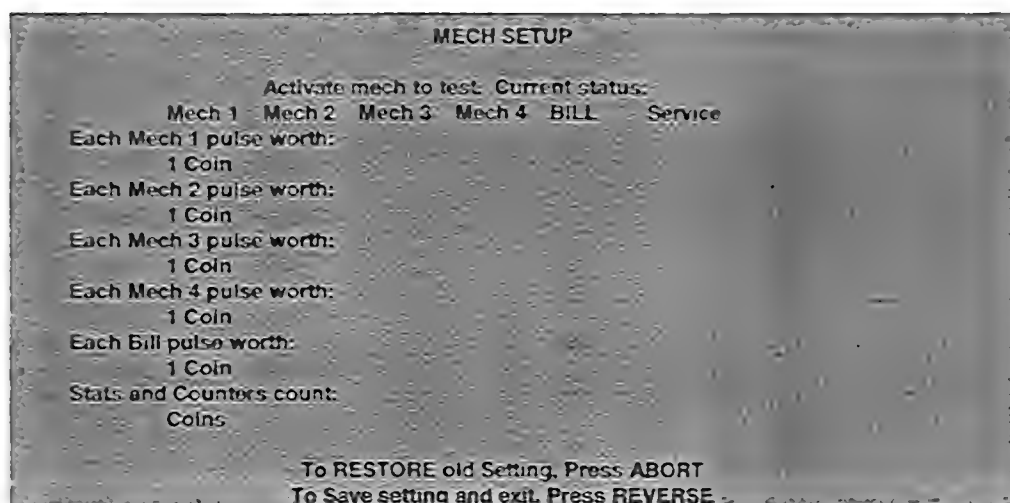
## COIN OPTIONS

The Coin Options are used to set up the coin mechanisms and set the pricing of the games. Factory default values can be considered standard.

Use the MUSIC and VIEW #2 buttons to select a particular menu item. The VIEW #1 and #3 buttons are used to change variables. Options may be reset to factory default values or changed after each viewing.



**PRICING OPTIONS MENU SCREEN**



**MECH SETUP MENU SCREEN**

The illustrations show how these screens will look with all of the factory default settings. Each press of the VIEW buttons will advance a variable through its range of choices. Some items have more options than others. It is recommended that all of them be viewed before one is selected.

## PRICING OPTIONS

Custom pricing sets credits required to start and continue a game, rewards for quantity buy-in, etc. The other options will disappear if free play is selected.

## MECH SETUP

This screen permits the operator to add or remove coin or bill mechanisms. Although values are shown for all devices, changes to unused inputs have no effect if there is no such currency acceptor in the game.

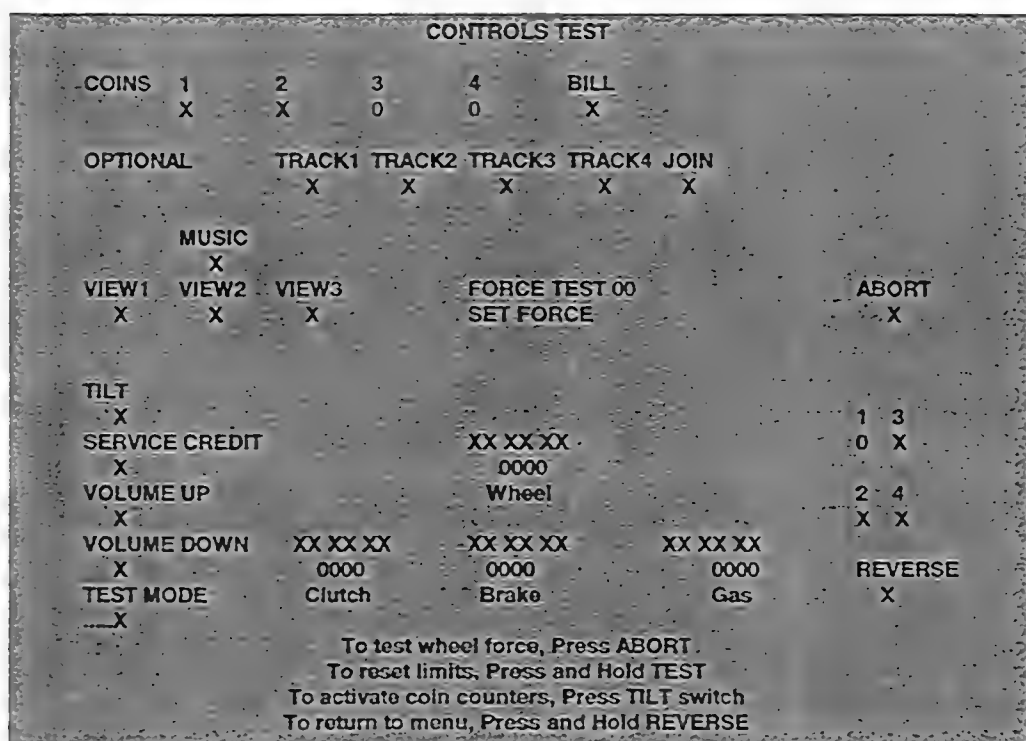
## CONTROLS TEST

These tests allow the operator to manually check each switch in the game.

### NOTE

*Some switches may not be used with this game. Check the wiring diagram and the mech setup items.*

Activate each switch and the indication on the screen changes state. Release the switch and the indicator returns to its previous condition. Switches may be tested in any combination.



### CONTROLS TEST MENU SCREEN

The Controls are shown on the screen as they are found on the dash, gearshift, coin door bracket, etc. Each control change should be exactly duplicated by a single indication on the menu screen.

The Controls Test screen is used to verify crossed wires, intermittent conditions, and stuck switches.

Press and hold ABORT to test the Steering Wheel force. Restrain the wheel with one hand during test. The force will increase to maximum and decrease to minimum, then change directions and repeat again.

Press and hold TEST MODE to reset the pedal travel limits. Depress and release each pedal during test. The digital indicator numbers change each time the computer detects a new position for each pedal. The numbers will turn green to indicate when pedal calibration has been successful.

Note and record the Coin Counter reading before beginning the test to avoid subsequent count errors. Press the Coin Door Slam Switch to increase the count by one digit. *Do not bend Slam Switch contacts.*

**NOTE:** The LEADER light illuminates when shifting into first gear (1) and off in all other gears. The optional WINNER light illuminates when shifting into third gear (3) and off in all other gears. ABORT, MUSIC and VIEW buttons are brightly illuminated when pressed and dim in other tests.

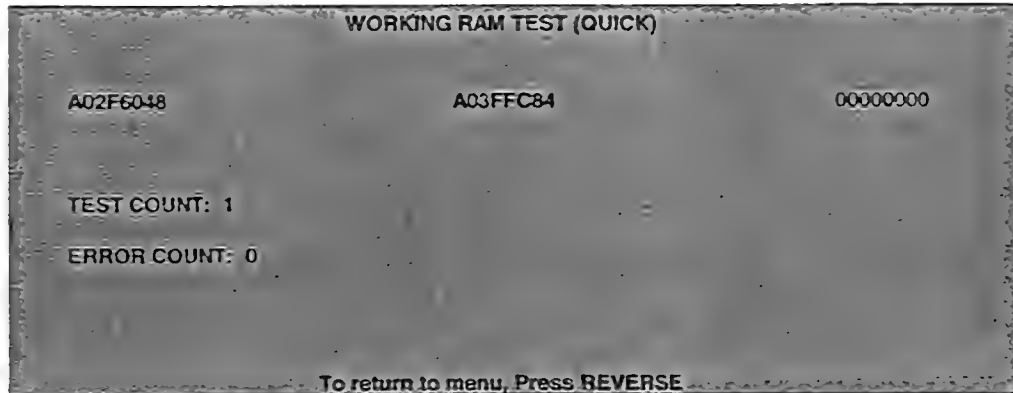
## MEMORY TESTS

The Memory Tests allow the operator to verify some functions of CPU Board Assembly memory circuits.

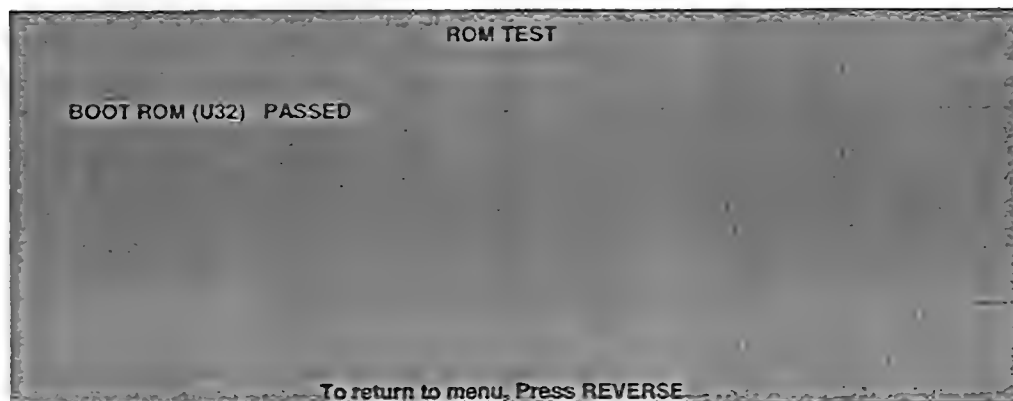
### NOTE

*These tests detect system errors, not game faults. Video images and graphics are on a Hard Disk Drive.*

Use the MUSIC and VIEW #2 buttons to select a particular menu item. The VIEW #1 and #3 buttons are used to choose another menu item. There are no custom settings or adjustable variables in these tests.



**QUICK RAM TEST MENU SCREEN**



**ROM TEST MENU SCREEN**

**WORKING RAM (QUICK)** performs a fast check of the storage area for the game variables. This test takes less than 10 seconds to run. After completion, the Memory Tests screen is displayed. The results of the test will be reported as pass or fail messages; error messages may be included.

**WORKING RAM (FULL)** performs a more thorough check of the storage area for the game variables. This test takes less than 45 seconds to run. After completion, the Memory Tests screen is displayed. The results of the test will be reported as pass or fail messages; error messages may be included.

**ROM TEST** performs a fast check of the storage area for the game instruction set. This test takes less than 2 seconds to run. At completion, the results display until REVERSE is pressed. The results of the test will be reported as pass or fail messages; error messages may be included.

**NOTE:** The memory tested here stores data required to permit player interaction with the game. Audio memory is tested separately (refer to the AUDIO CHECKSUMS screen in SOUND TESTS).

## SOUND TESTS

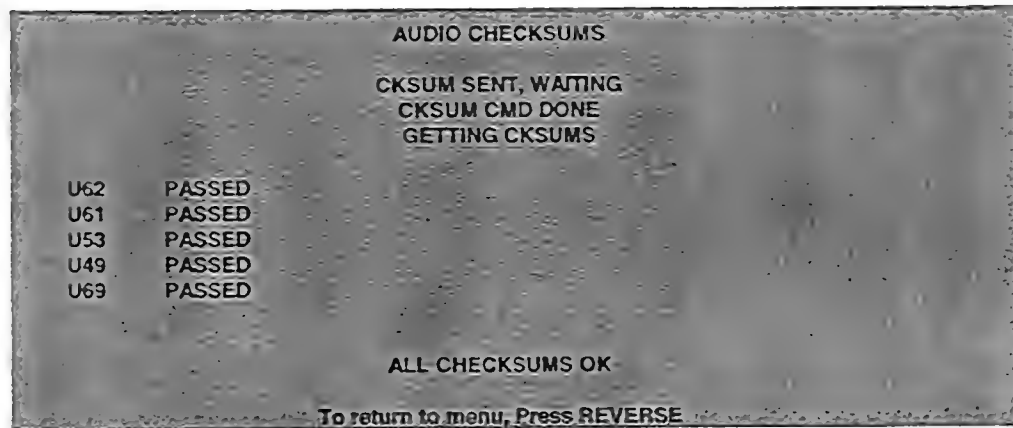
These tests verify that the audio components are connected and operating properly.

**NOTE:** The level must be raised for the speakers to be heard. Check the volume setting before testing.

Use the MUSIC and VIEW #2 buttons to select a particular menu item. The VIEW #1 and #3 buttons are used to change variables. There are no custom settings or adjustable variables in these tests.



### SPEAKER TEST MENU SCREEN



### AUDIO CHECKSUM MENU SCREEN

**AUDIO SPEAKER TEST** sends alternating left and right voice sounds to the individual front and rear speakers. The voices should be clear and distinct from each other. Each voice must come from the location identified. Refer to ADJUST VOLUME screen if necessary to increase loudness for this test.

Press ABORT to test the seat speaker. The seat will vibrate and sound will be heard in all speakers.

The Audio Speaker Test screen is used to verify crossed connections, incorrect phase, and distortion.

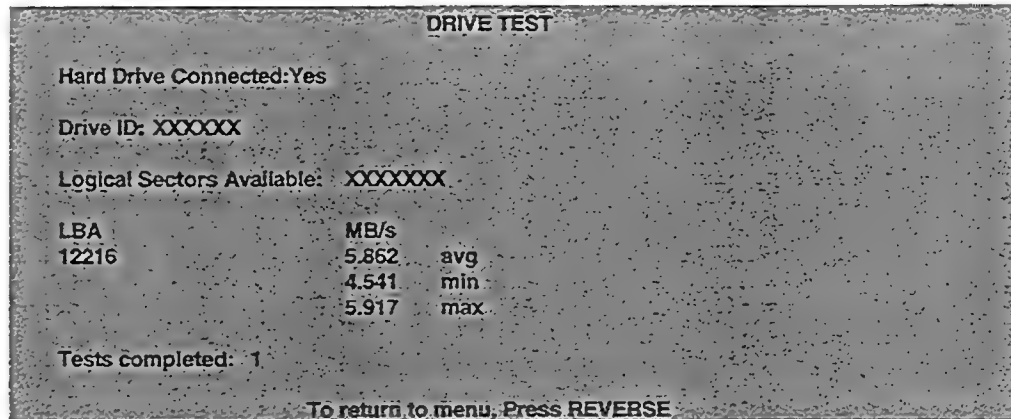
**AUDIO CHECKSUMS** are a series of diagnostic routines which analyze the digital sound circuits. The results of the tests will be reported as pass or fail messages; sounds may also accompany the tests. The program version will be found at the bottom of the screen along with the sound system status report.

The Audio Checksums are useful in locating digital circuit difficulties, especially when there is no sound from the speakers with the volume set at high levels. These tests detect sound memory problems.

## DISK TESTS

The Disk Tests allow the operator to verify the functions of the Hard Disk Drive Assembly.

Use the MUSIC and VIEW #2 buttons to select a particular menu item. The VIEW #1 and #3 buttons are used to change variables. There are no custom settings or adjustable variables in these tests.



### DRIVE TEST MENU SCREEN

#### Hard Drive Connected

This test routine verifies the interface between the CPU Board Assembly and the Hard Disk Drive itself. The processor requests disk information. Data cannot be retrieved successfully if there is a problem.

#### Drive ID

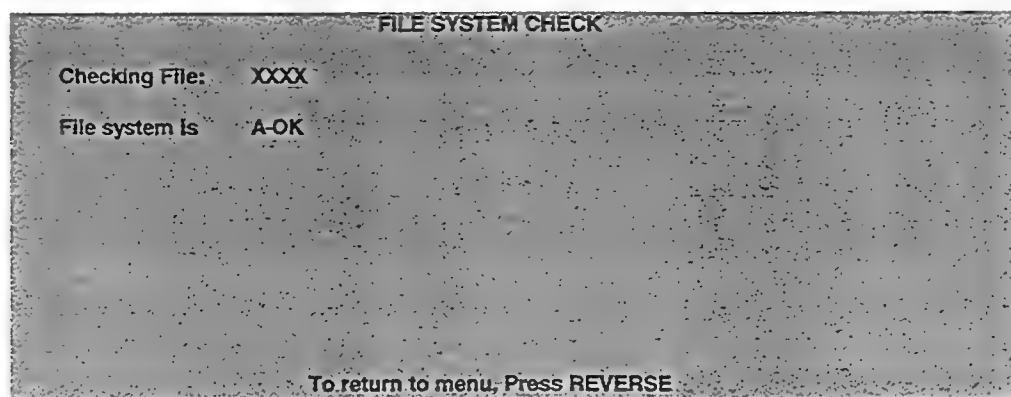
This is an industry standard identification for Hard Disk Drive type and capacity. This is a manufacturer hardware number only; it will not identify the software or the game program stored on the drive assembly.

#### Logical Sector Test

This test will perform a sector by sector read/verify test on the disk drive. As the status of each block of sectors is checked, the speed of the data transfer is compared to its acceptance limits.

#### Tests Completed.

These tests run over and over. The number increases each time the cycle repeats (approx. 4 minutes).



### FILE SYSTEM MENU SCREEN

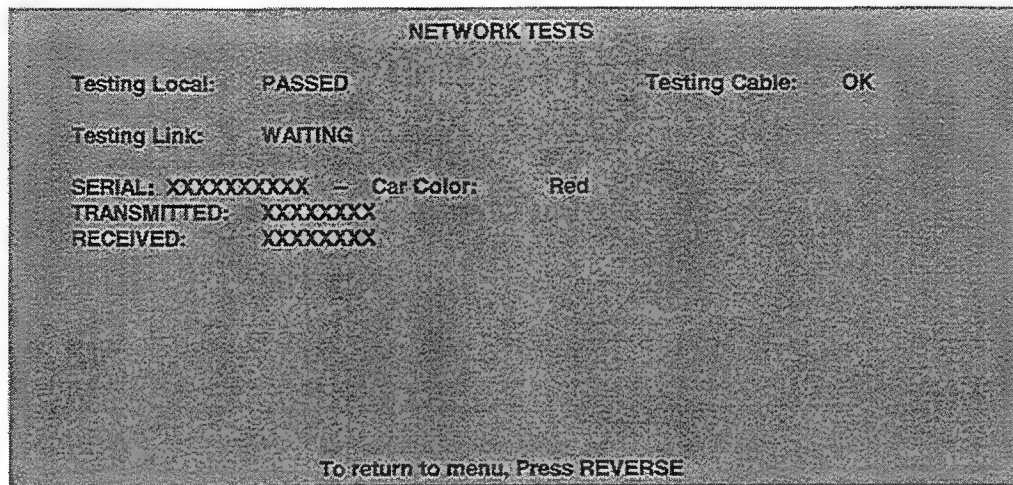
#### Checking File

This routine will perform a file by file check of data stored on the hard disk drive and report its findings. If errors are detected the system tries to fix them in the process (approx. 2 minutes per cycle). The system reports on the severity of the errors and advises if the game performance will be affected.

## NETWORK TESTS

The Network Tests provide routines for verifying the communication circuits when games are linked.

There are no custom settings or adjustable variables in these tests.



### NETWORK TESTS MENU SCREEN

Several different options allow cabinets to be linked together for tournament type player competition. This screen allows the operator to determine if the linking equipment is networking or *not* working. The results of these tests either confirm proper operation or indicate where the problem may be found.

**NOTE:** This group of tests checks only system hardware (cables and communications circuits). Inspect for disconnected or broken cable, hubs, etc. Individual games are not affected by faults.

#### Testing Local

This test performs an internal check of the local communication circuits in the game cabinet. It does not test any cables, hubs, or the other game cabinets. An error message indicates CPU board difficulties.

#### Testing Cable

This verifies complete signal paths. "???" is a normal response to this test when the game is not linked. Linked games require all cabinets, couplers, hubs, etc. to be powered ON and connected to report OK.

#### Testing Link

This sends data out from each active game and looks for responses. At least two cabinets must be networked properly to pass this test. Test results take longer to report as more games become active.

#### Game and Car ID

Linked games must exchange information back and forth on the network. This screen area shows each active linked cabinet and confirms data flow. Only one cabinet will transmit data, but all must receive it.

#### Transmitted

This number is a running count of the data packets sent by the local game cabinet. Packet quantities increase continually until you exit this screen. This cabinet will always receive each packet it transmits.

#### Received

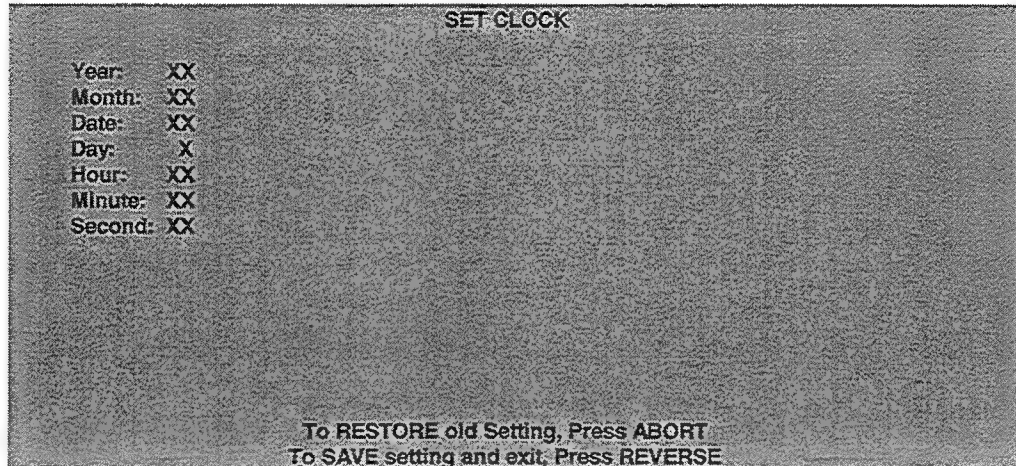
This number is a running count of the data packets collected from the network. It increases until you exit. Each linked cabinet must receive packets from the local cabinet or the communications network is faulty.

**NOTE:** This Network Test applies only to the local game cabinet (your present location). This cabinet is always listed first in the report. Other cabinets will show data received, but only this game shows transmit.

## SET CLOCK

The Set Clock screen allows the time and date to be entered accurately.

Use the MUSIC and VIEW #2 buttons to select a particular menu item. The VIEW #1 and #3 buttons are used to change the variables. There are no custom settings or factory default values for these items.



### SET CLOCK MENU SCREEN

The clock is used to provide accurate game statistics. The clock does not affect the game operation.

Once set, the clock will run until the battery dies or circuits are disrupted by service or some major fault. Periodically examine the top lines of the SELF TEST screen for the correct time and date.

Press REVERSE to save new information. The ABORT button returns items to the previous values.

**NOTE: The SELF TEST menu screen shows the time only when requested (not running time).**

Year

Two digits. Range 00 to 99.

Month

Two digits. Range 01 to 12.

Date

Two digits. Range 01 to 31.

Day

Only one digit. Range 1 to 7.

Hour

Two digits. Range 00 to 23.

Minute

Two digits. Range 00 to 59.

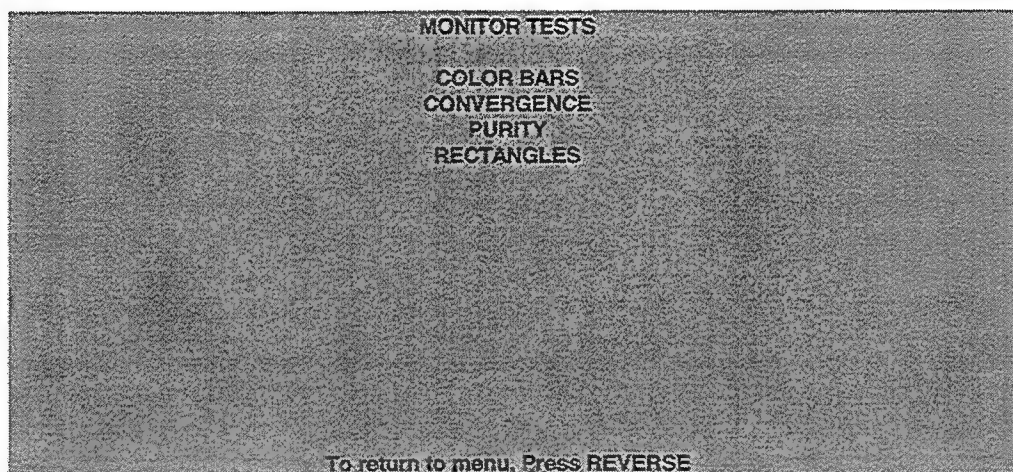
Second

Two digits. Range 00 to 59.

## MONITOR TESTS

The Monitor Tests provide patterns for verifying the monitor performance or making adjustments.

Use the MUSIC and VIEW #2 buttons to select a particular menu item. The VIEW #1 and #3 buttons are used to change variables. There are no custom settings or adjustable variables in these tests.



### MONITOR TESTS MENU SCREEN

**COLOR BARS** fills the screen with shades of colors to verify red, green, blue and white level dynamic adjustments. Each color bar should appear sharp, clear, and distinct from bars on either side.

Press the ABORT button two times to change the color of the screen border. Press REVERSE to exit.

The Color Bars screen is useful in adjusting the monitor brightness and contrast.

**CONVERGENCE** tests fill the screen with a grid and a series of dots. The grid and the dots should be all one color, with no fringes or parallel images. The lines should be straight and the dots round.

Press the ABORT button two times to change the color of the screen grid lines. Press REVERSE to exit.

The Convergence tests are useful in verifying the monitor convergence, linearity, and dynamic focus.

**PURITY** tests fill the screen with 100% of the chosen color at normal intensity. Each screen should be absolutely uniform from top to bottom and side to side. No retrace lines or noise should be visible.

Press the ABORT button eight times to change the color of the screen. Press REVERSE to exit.

The Purity tests are useful in verifying monitor intensity, black level, blanking and degaussing.

**RECTANGLES** tests display solid color boxes over a contrasting background screen. The rectangle should be centered with all four sides visible. The sides of the background should not be visible.

Press the ABORT button two times to change the color of the screen. Press REVERSE to exit.

The Rectangles tests are useful in verifying scan size and screen uniformity.

If any of the tests shows a need for adjustment, use the proper knobs on the Monitor Controls board.

## SWITCHES AND JUMPERS

The CPU Board has a number of hardware variables which can be changed to adapt this assembly to other uses. Jumpers determine which circuit paths are active, and DIP switches select instructions.

### Switches

There is one CPU Board push button switch (S2, near the battery). This switch resets the processor. This switch may be used during service to restart the game without cycling the power off and on again.

There are two blocks of DIP Switches (U8 and U9) on this CPU Board set. Each block consists of eight individual switches. These switches are factory set for normal game operation.

**NOTE: All instruction variables for this game are software selectable from the menu system. Each DIP Switch should be set to its OFF position (Factory default) for proper program operation.**

### Jumpers

There is one block of jumpers (P20) on this CPU Board set. The other jumpers are individual pins. Only one jumper (J9 - Sync Polarity) is installed on the board. This jumper is only for non-standard monitors.

**NOTE: The circuit paths have been optimized at the factory during the board test procedure. Each jumper should be out (disconnected) to avoid error messages or video sync problems.**

## ERRORS

Errors are detected by the system and reported on the screen. Some errors, such as minor disk data faults, can be repaired by the system. Other errors, such as player control calibration, may be fixed by manually resetting the values into game memory. In most cases, the game will continue to operate after errors have been found, although performance may be reduced. **Do not ignore error messages.**

Always record error messages before attempting to correct any problem. Some temporary messages will be stored under the User Messages report (refer to STATISTICS screen in this section).

### NOTES

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# **SAN FRANCISCO**

# ***RUSH THE ROCK***<sup>TM</sup>

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## **SECTION TWO**

## **PARTS**

### **Warning**

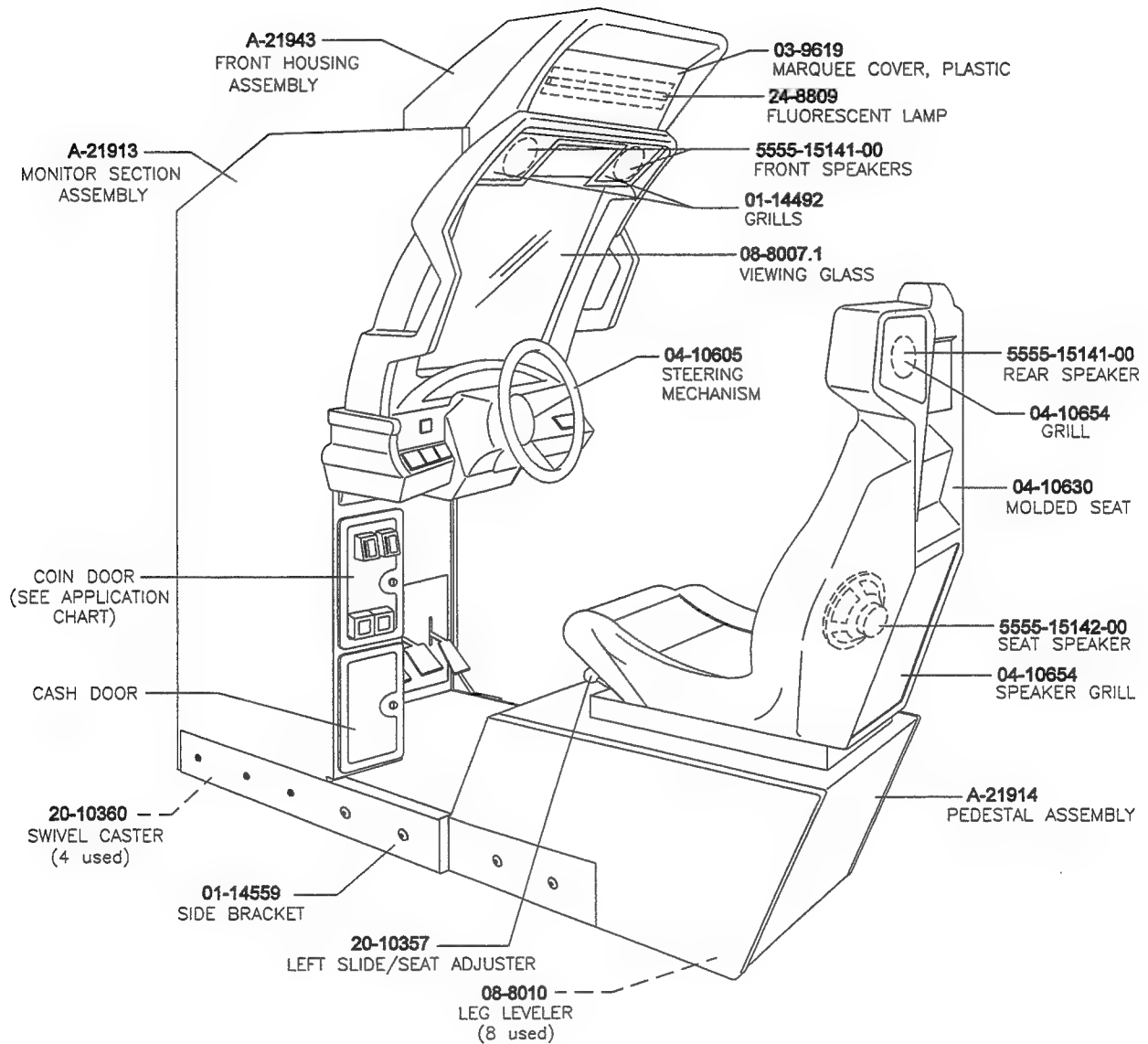
USE OF NON-ATARI PARTS OR CIRCUIT MODIFICATIONS MAY CAUSE SERIOUS INJURY OR EQUIPMENT DAMAGE! USE ONLY ATARI AUTHORIZED PARTS.

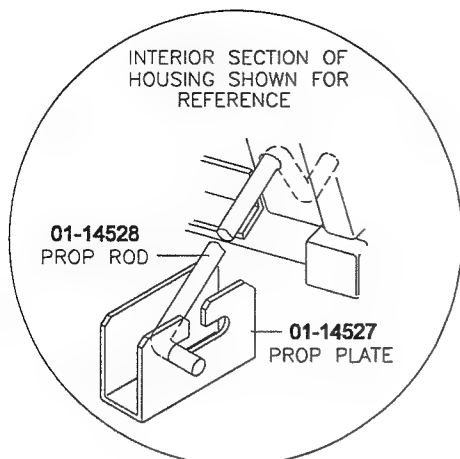
\* For safety and reliability, substitute parts and modifications are not recommended.

\* Substitute parts or modifications may void FCC type acceptance.

# CABINET ASSEMBLY

## LEFT SIDE VIEW

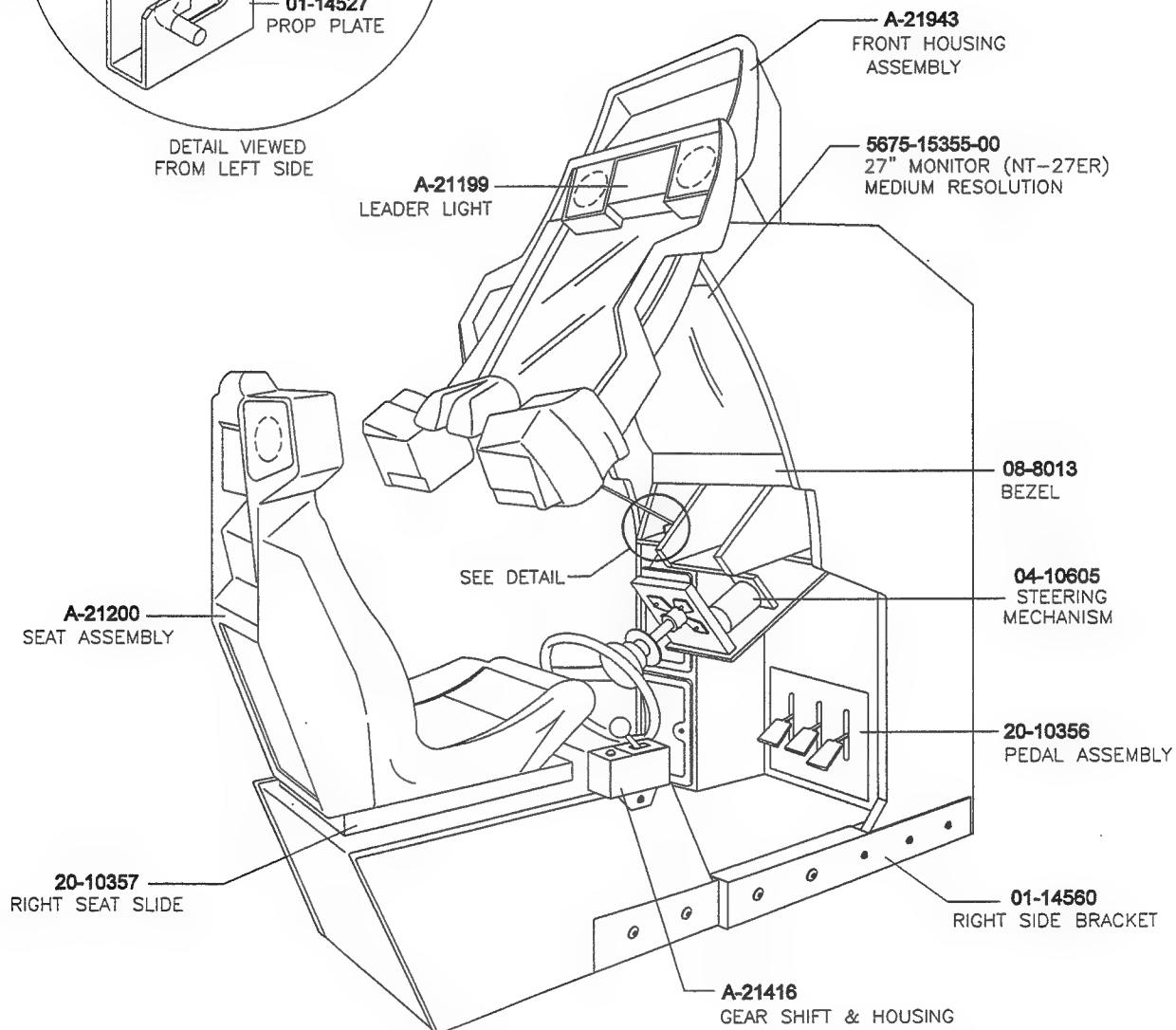




DETAIL VIEWED  
FROM LEFT SIDE

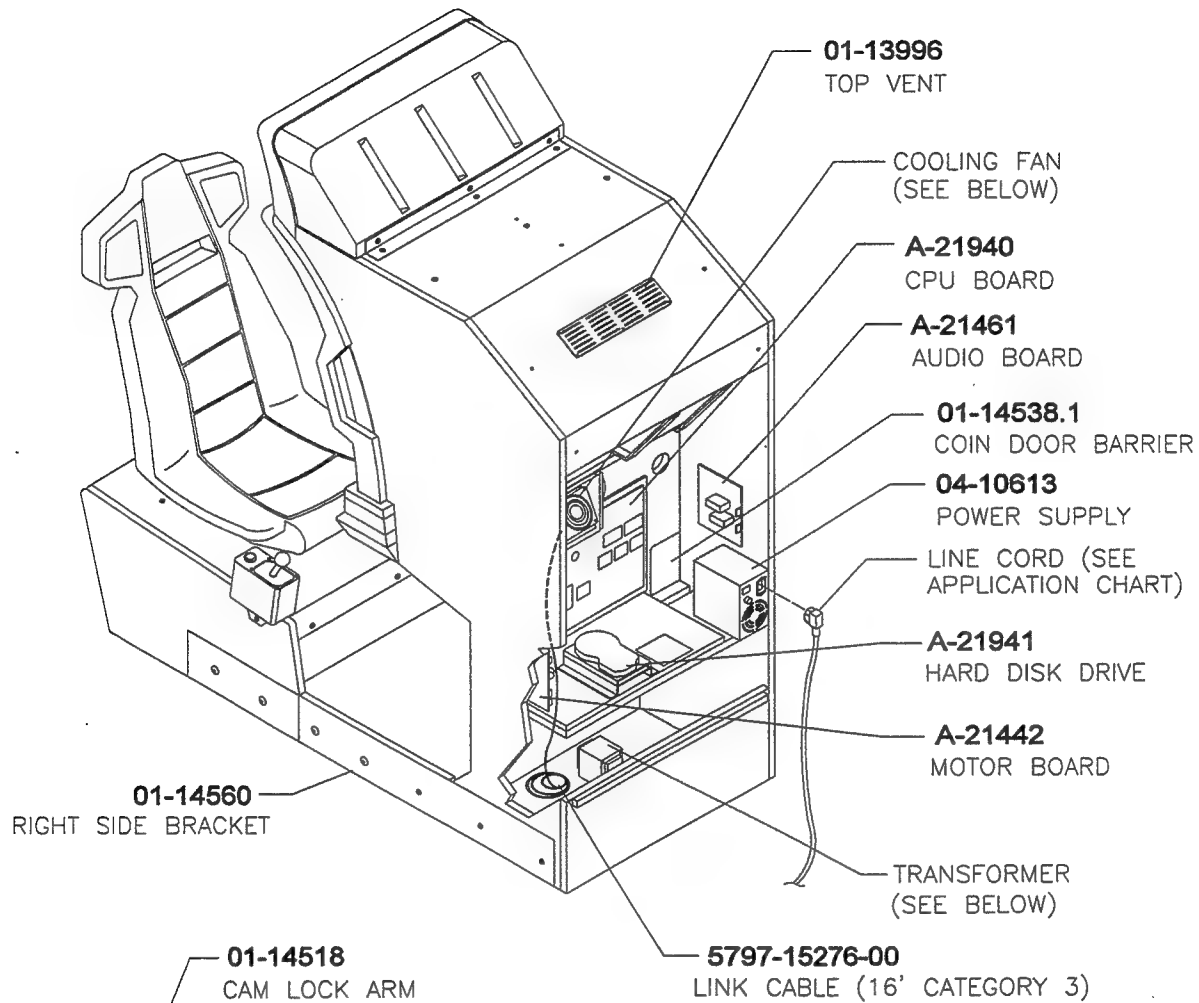
# CABINET ASSEMBLY

## RIGHT SIDE VIEW



# CABINET REAR VIEW

Complete Cabinet Assembly 30031-C

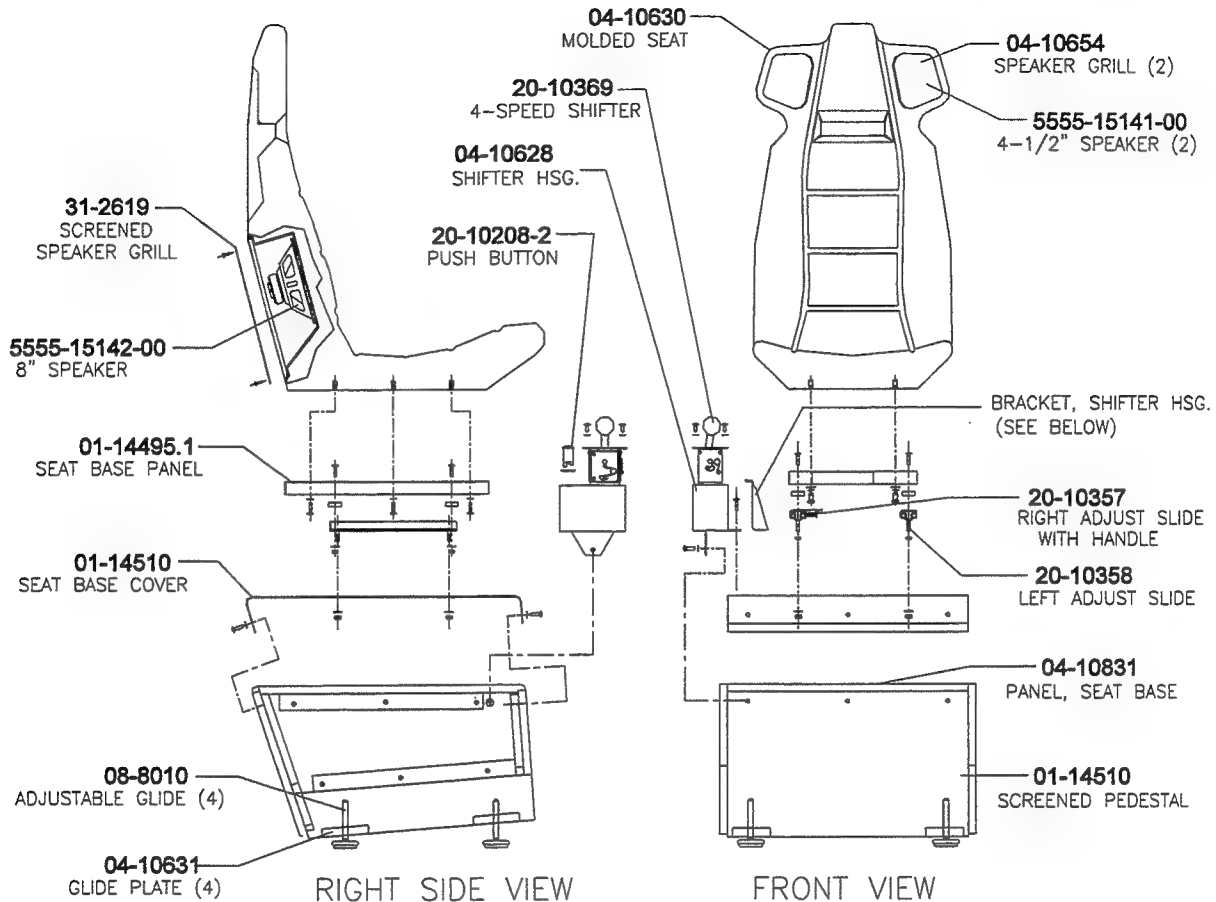


## ITEMS NOT SHOWN:

20-10399	COOLING FAN (120VAC 60Hz)
20-10234	COOLING FAN (220VAC 50Hz)
5610-15216-00	AUTOTRANSFORMER (100VAC 50Hz) (mounted on rear cabinet floor)
5610-15148-01	TRANSFORMER (120VAC 60Hz)
5610-15219-01	TRANSFORMER (230VAC 50Hz)

# A-21200 SEAT ASSEMBLY

## AND ASSOCIATED ASSEMBLIES



### SEAT HARDWARE:

PART NUMBER	DESCRIPTION
01-14519	SPACER 5/16 (4)
4110-01001-20	SMS #10 X 1-1/4 P-PH (40)
4208-01203-12	WS #8 X 3/4 PH-RWH (8)
4108-01098-11B	TR #8 X 11/16 TRX-PH (14)
4701-00006-00	LW 3/8 SPLIT (5)
4320-01123-16B	CB 1/4-20 X 1 RH (4)
4322-01070-12	MS 3/8-16 X 3/4 HH (5)
4425-01119-00	NUT 5/16-18 ESN UNC (4)
4420-00128-00	NUT 1/4-20 KEPS UNC (4)
4700-00032-00	FW .328 X .562 X .059 (4)
4700-00048-00	FW .375 X .875 X .059 (5)

### PEDESTAL HARDWARE:

PART NUMBER	DESCRIPTION
4020-01100-20	TR 1/4-20 X 1-1/4" BH CS (14)
4700-00032-00B	FW .265 X .625 X .067 BLK OX (14)

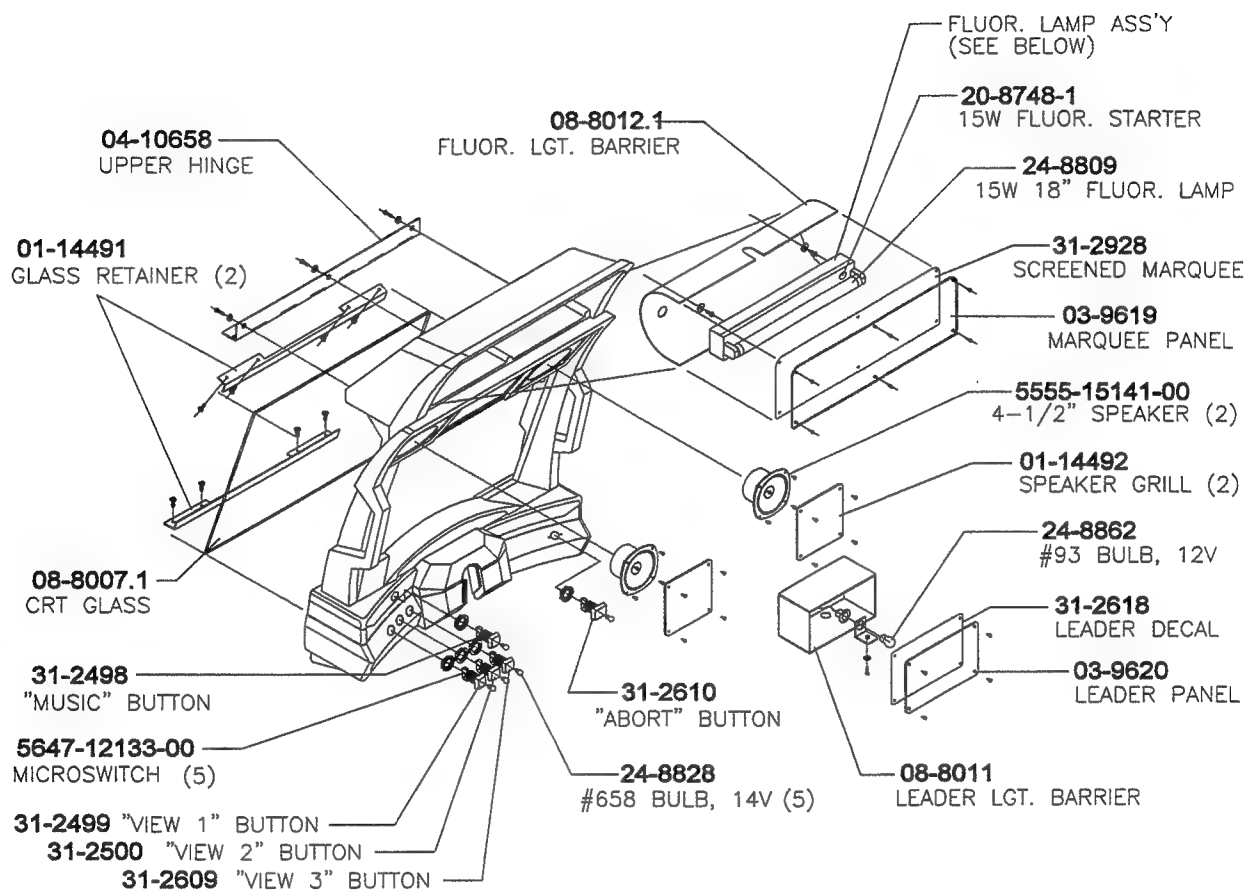
### SHIFTER HOUSING HARDWARE:

01-14533	BRACKET, SHIFTER HOUSING, RIGHT
01-14569	BRACKET, SHIFTER HOUSING, LEFT
4008-0110-08	MS 8-32 X 1/2 BTN (4)
4700-00012-00B	FW .187 X .375 X .040 BLK (4)

### ITEMS NOT SHOWN:

H-21432	SPEAKER CABLE
H-21433	SHIFTER CABLE
04-10628	RIGHT SIDE SHIFTER HOUSING
04-10656	LEFT SIDE SHIFTER HOUSING
04-10792	LEFT SIDE BRACKET
08-7377	LEG LEVELER (2)
4422-01117-00	NUT 3/16-16 NUT (2)

# A-21943 FRONT HOUSING ASSEMBLY



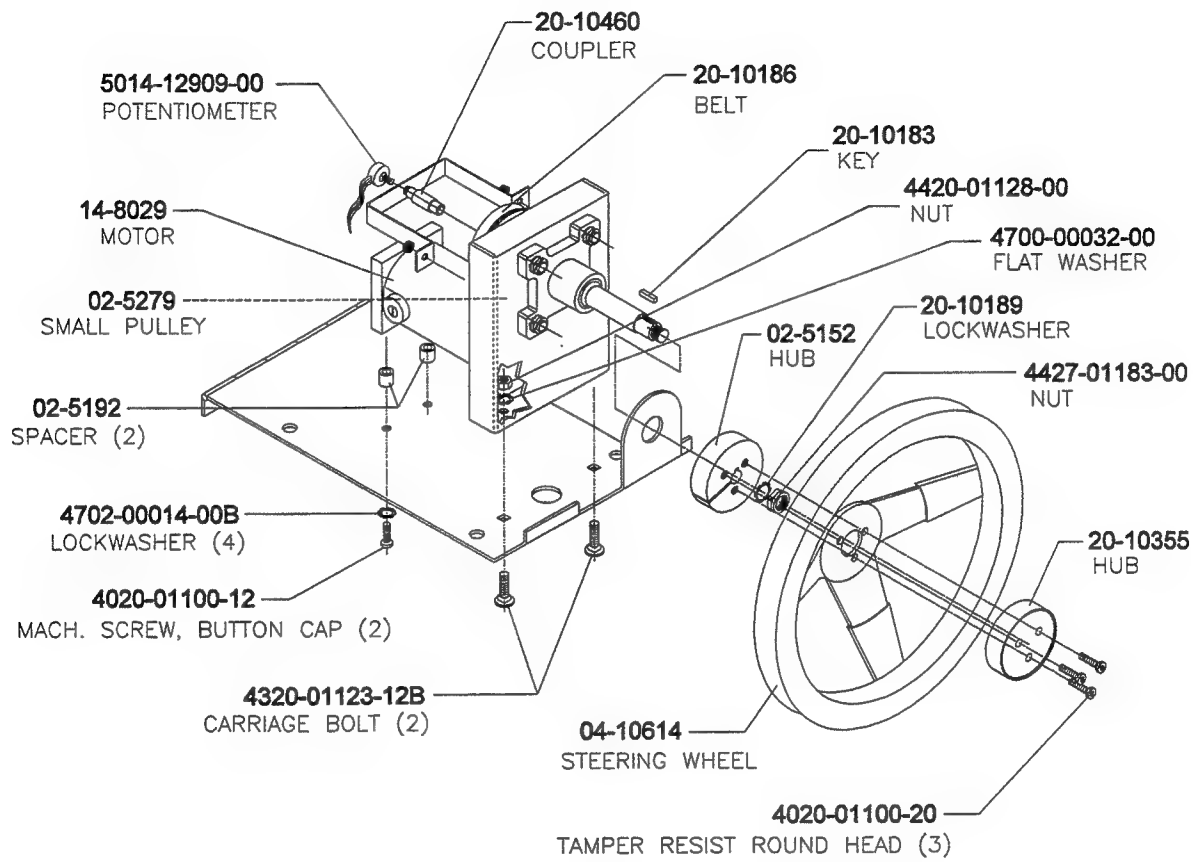
## HARDWARE:

PART NUMBER	DESCRIPTION
20-10169-4	WELL NUT 10-32 x 5/8 (2)
4010-01007-12	MS 10-32 x 3/4 P-PH (3)
4020-01100-08	TR TX 1/4-20 x 1/2 BH (3)
4108-01098-11B	TR #8 x 11/16 TRX-PH (18)
4110-01001-10	SMS #10 X 5/8 P-PH (8)
4106-01001-10	SMS #6 X 5/8 P-PH (8)
4608-01081-11	H-F #8 X 11/16 PL-HWH
4700-00129-00	FW .203 X .468 X .030 (3)
4700-00032-00B	FW .265 X .625 X .067 (3)

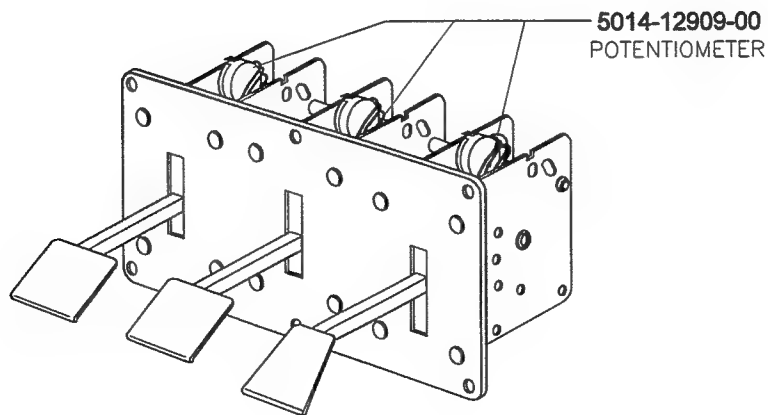
## ITEMS NOT SHOWN:

H-21429.1	"VIEW" SWITCH CABLE
H-21430.1	"ABORT" SWITCH CABLE
H-22057	FLUORESCENT LAMP CABLE
H-21431.1	LIGHT/SPEAKER CABLE
A-21198	FLUORESCENT LAMP 120VAC 60HZ
A-21477	FLUORESCENT LAMP 230VAC 50HZ
A-21605	FLUORESCENT LAMP 100VAC 50HZ
24-8874	ALTERNATE FLUORESCENT LAMP

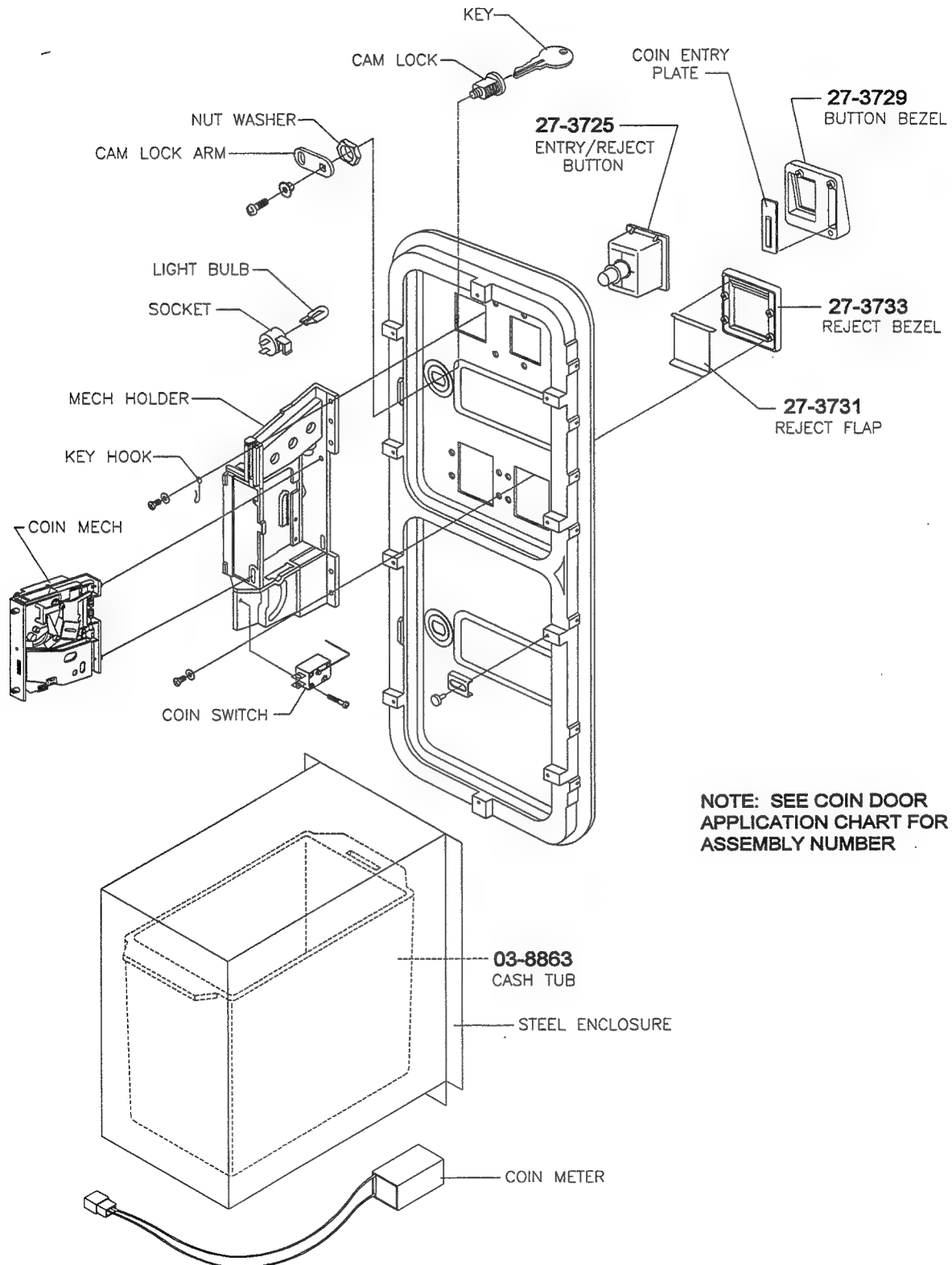
## 04-10605 STEERING WHEEL ASSEMBLY



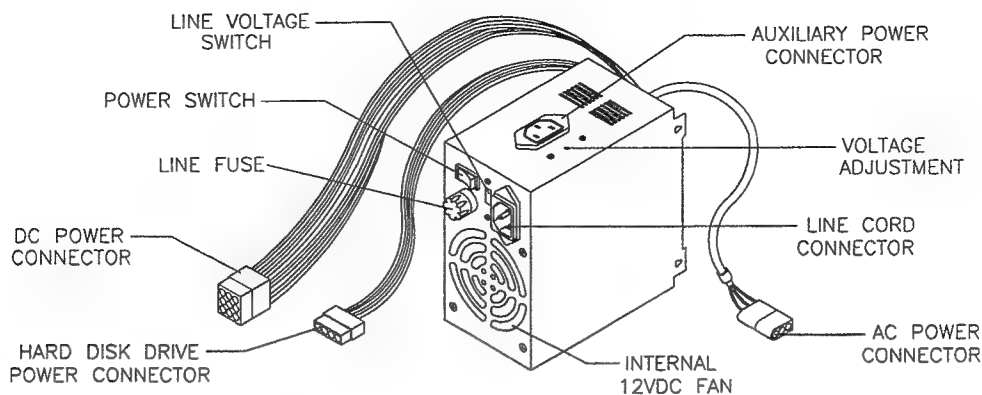
## 20-10356 PEDAL ASSEMBLY



# COIN DOOR ASSEMBLY



## 04-10613 POWER SUPPLY



### A.C. AUXILIARY POWER CONNECTOR

PINS	FUNCTION	COLOR
1	LINE	BLACK
2	GROUND	GREEN
3	NEUTRAL	WHITE

### D.C. MAIN POWER CONNECTOR

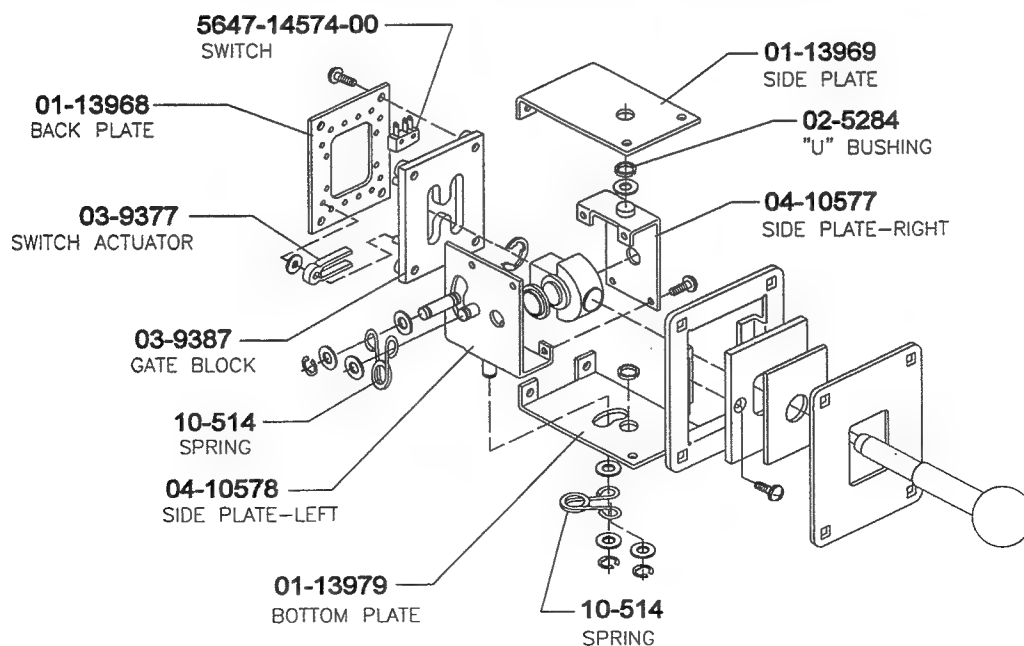
PINS	FUNCTION	COLOR
1,2,3	+5 VDC	RED
4,5,6	RETURN	BLACK
7	-5 VDC	BLUE
8	+12 VDC	YELLOW
9	-12 VDC	WHITE

### HARD DISK DRIVE POWER CONNECTOR

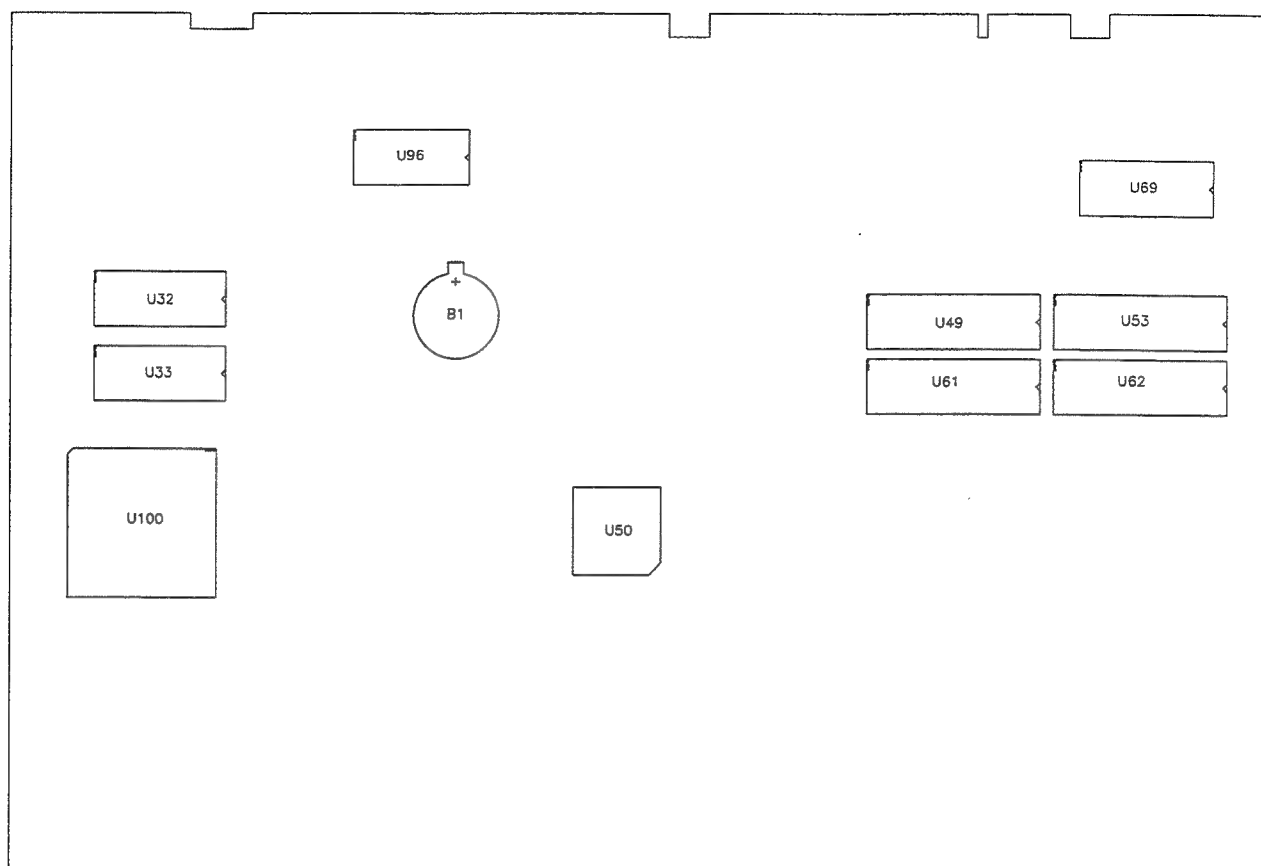
PINS	FUNCTION	COLOR
1	+5 VDC	RED
2,3	RETURN	BLACK
4	+12 VDC	YELLOW

**NOTE:** Many computer grade power supplies use alternate wire colors. This is acceptable as long as the pinout is correct.

## 20-10369 4-SPEED SHIFTER



## A-21937 CPU BOARD ASSEMBLY



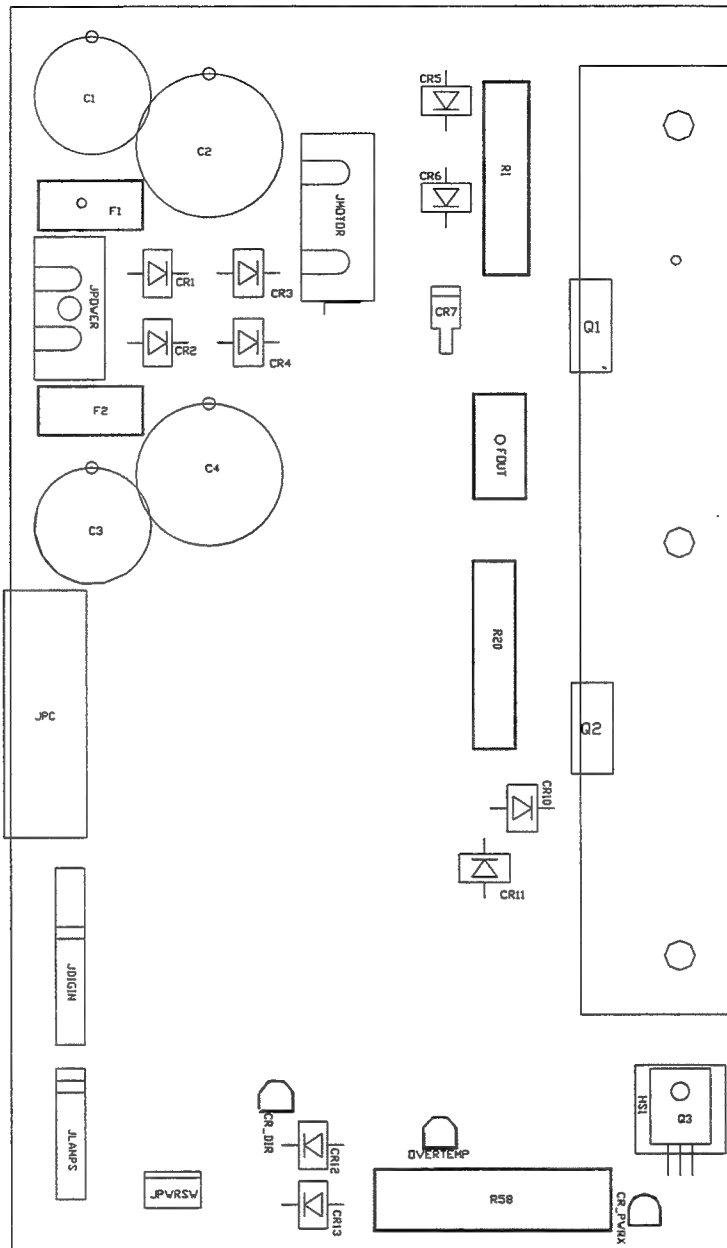
### Field Replaceable Parts

DESIGNATION	PART NUMBER	FUNCTION	DESCRIPTION
B1	5880-11056-00	Memory Backup	3 Volt Lithium Battery
U32	A-5343-30031-1	CPU Boot ROM	EPROM Assembly
U33*	—	Expansion Boot ROM	EPROM Assembly
U49	5341-15520-03	Sounds	EPROM Assembly
U50**	A-21445 (IDT)	Reset Logic (IDT)	PAL Assembly
U53	5341-15520-02	Sounds	EPROM Assembly
U61	5341-15520-01	Sounds	EPROM Assembly
U62	5341-15520-00	Sounds	EPROM Assembly
U69	A-5343-30031-2	Sound Boot ROM	EPROM Assembly
U96	A-21950	Video PIC	EPROM Assembly
U100**	5400-15263-00	Microprocessor (IDT)	CPU Assembly

**\*NOTE:** Not used in early production games. Separate instructions will be included when needed.

**\*\*NOTE:** U50, U100, and printed circuit board must be from the same matched part number set. CPU Boards for this game are interchangeable, but chip sets must not be mixed on a board.

## A-21442 MOTOR BOARD ASSEMBLY



### Field Replaceable Parts

DESIGNATION	PART NUMBER	DESCRIPTION	FUNCTION
F1	5731-14529-00	Cartridge Fuse	5x20mm 6.3A 250V SB
F2	5731-14529-00	Cartridge Fuse	5x20mm 6.3A 250V SB
F OUT	5731-15251-00	Cartridge Fuse	5x20mm 5.0A 250V SB
R1	5011-15241-00	Power Resistor	.05 ohm 5% 5W
R20	5011-15241-00	Power Resistor	.05 ohm 5% 5W
R58	5012-15246-00	Power Resistor	22 ohm 10% 15W WW
Q1	5370-15257-00	Output Driver	OPA 541 AP Power IC

DESIGNATION	PART NUMBER	DESCRIPTION	FUNCTION
IC5	5370-15011-00	Amplifier Quad Power Audio	Audio Output
IC6	5370-15011-00	Amplifier Quad Power Audio	Audio Output
Q1	5460-15003-00	Fixed Voltage Reg. +5v 5%	Voltage Regulator

## ***Other Parts Necessary***

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### Protection

Fuse, 1A, 250V, FB, 3AG	5730-15278-00
Fuse, 3A, 250V, SB, 3AG	5731-10356-00
Fuse, 5A, 250V, SB, 5 x 20mm	5731-15251-00
Fuse, 6.3A, 250V, SB, 5 x 20mm	5731-14529-00
Lamp, 14V, .080A, Wedge Base	24-8828

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### Cables

View Switches Harness Cable	H-21429.1
Abort Switch Harness Cable	H-21430.1
Dash Light and Speaker Cable	H-21431.1
Seat Woofer and Speaker Cable	H-21432
Gear Shifter Harness Cable	H-21433
Main Cabinet Harness Cable	H-21923
Pedestal Harness Cable	H-21924
A.C. Wiring Harness Cable	H-21435
USA DBV Ready Cable	H-21514.1
Housing Fluorescent Lamp Cable	H-22057
Cabinet Fluorescent Lamp Cable	H-22058
Hard Disk Drive Ribbon Cable	5795-15286-00

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### Documents

Game Manual	16-30031-101
Product Safety Manual	16-10342.1
Hard Drive Handling Guide	16-10076
Electronic Device Caution Sheet	16-10077

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### Tools

T-20 Torx Key	20-9620
T-27 Torx Key	20-10140

# LINE CORD APPLICATION CHART

Part Number	5850-14699-00	5850-15521-01	5850-14699-02	5850-14699-03	5850-14699-04	5850-14699-05	5850-14699-06
Country							
USA		■					
UK				■			
Italy	■						
Japan							■
New Zealand						■	
Germany			■				
Spain			■				
Denmark			■				
Finland			■				
Holland			■				
Norway			■				
Switzerland					■		
Hungary			■				
Canada		■					
Austria			■				
France			■				
Australia						■	
Belgium			■				

# COIN DOOR APPLICATION CHART

Part Number	09-72000-15	09-72000-17	09-72000-22	09-72000-23	09-72000-25	09-72000-33	09-96010-00
Country							
USA						■	
UK							■
Italy							■
Japan	■						
New Zealand		■					
Germany							■
Spain							■
Denmark							■
Finland							■
Holland							■
Norway							■
Switzerland							■
Hungary							■
Canada						■	
Austria							■
France							■
Australia							■
Belgium							■





# **SAN FRANCISCO**

# ***RUSH THE ROCK***<sup>TM</sup>

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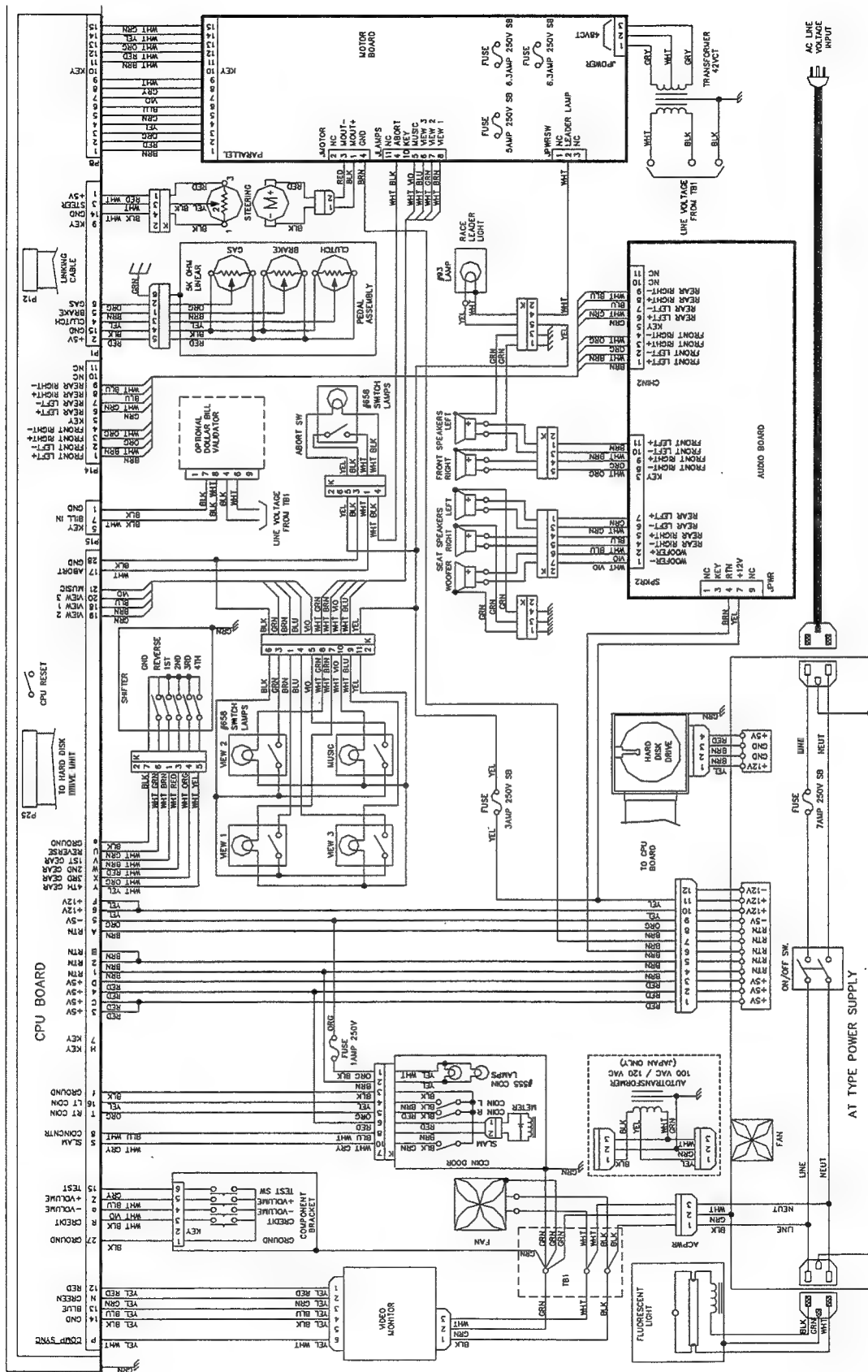
## **SECTION THREE**

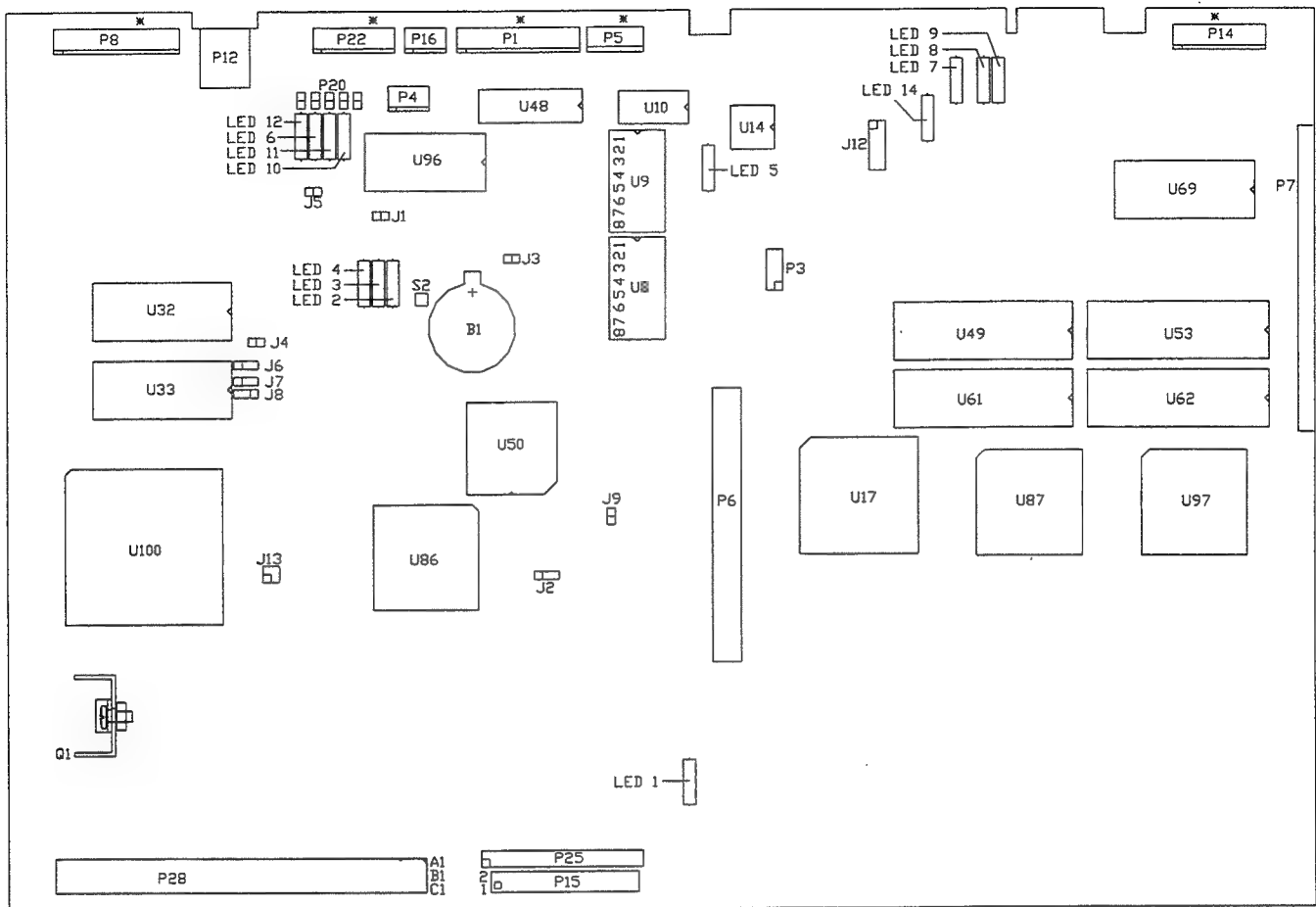
## **WIRING**

### **Warning**

Failure to reconnect all ground wires or replace metal shields and covers with each mounting screw installed and securely tightened may result in radio frequency interference.

# POWER WIRING DIAGRAM





**CPU BOARD LED INDICATOR STATUS CHART**

DESIGNATION	LOCATION	FUNCTION	COLOR	STATE	MEANING
LED 1 (HDD)	BOTTOM CENTER NEAR P15 & P25	HARD DISK ACTIVITY	RED	OFF	NOT IN USE
				ON	LOCKED UP (Note 1)
				BLINKING	NORMAL OPERATION
LED 2	MIDDLE CENTER NEAR B1 & S2	CPU RESET INDICATOR	RED	OFF	NORMAL OPERATION
				ON	PROCESSOR RESET
				BLINKING	RESET LOOP (NOTE 2)
LED 3	MIDDLE CENTER NEAR B1 & S2	INDICATOR	YELLOW	OFF	NORMAL OPERATION
				ON	PROCESSOR RESET
				BLINKING	RESET LOOP (NOTE 3)

**CPU BOARD LED INDICATOR STATUS CHART (continued)**

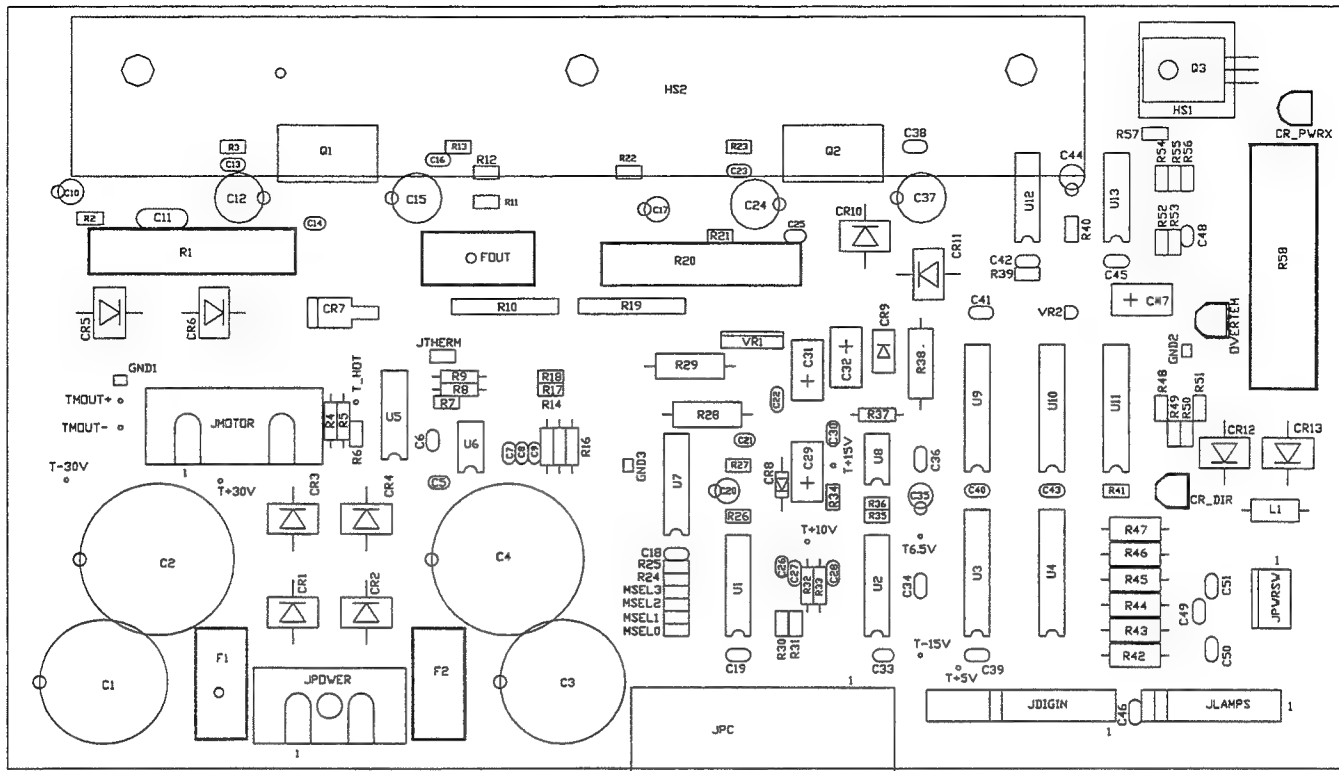
DESIGNATION	LOCATION	FUNCTION	COLOR	STATE	MEANING
LED 4	MIDDLE CENTER NEAR B1 & S2	INDICATOR	GREEN	OFF	NO BOOT ROM (NOTE 4)
				ON	PROCESSOR RESET
				BLINKING	NORMAL OPERATION
LED 5 (IOA)	UPPER CENTER NEAR U8 & U9	INDICATOR	GREEN	OFF	NO I/O FUNCTIONS PRESENT
				ON	NORMAL OPERATION
				BLINKING	I/O ASIC FAULT (NOTE 5)
LED 6 (RX)	UPPER LEFT NEAR P12	LINK RECEIVE	YELLOW	OFF	NOT IN USE (NO GAME LINK)
				ON	RECEIVING DATA (NOTE 6)
				BLINKING	NORMAL OPERATION
LED 7	UPPER RIGHT NEAR P14	+12V POWER INDICATOR	RED	OFF	NO POWER
				ON	NORMAL OPERATION
				BLINKING	POWER FAULT (Note 7)
LED 8	UPPER RIGHT NEAR P14	-5V POWER INDICATOR	RED	OFF	NO POWER
				ON	NORMAL OPERATION
				BLINKING	POWER FAULT (Note 8)
LED 9	UPPER RIGHT NEAR P14	+5V POWER INDICATOR	RED	OFF	NO POWER
				ON	NORMAL OPERATION
				BLINKING	POWER FAULT (Note 9)
LED 10 (LNK)	UPPER LEFT NEAR P12	LINK VERIFY PULSE	GREEN	OFF	NOT IN USE (NO GAME LINK)
				ON	NORMAL OPERATION
				BLINKING	LINK FAULT (Note 5)
LED 11 (SEL)	UPPER LEFT NEAR P12	CPU LINK ACTIVITY	RED	OFF	NOT IN USE (NO GAME LINK)
				ON	CPU LINK ACTIVE (NOTE 11)
				BLINKING	NORMAL OPERATION

### CPU BOARD LED INDICATOR STATUS CHART (continued)

DESIGNATION	LOCATION	FUNCTION	COLOR	STATE	MEANING
LED 12 (TX)	UPPER LEFT NEAR P12	LINK TRANSMIT	RED	OFF	NOT IN USE (NO GAME LINK)
				ON	SENDING DATA (Note 12)
				BLINKING	NORMAL OPERATION
LED 13	NOT INSTALLED	NONE	---	---	--- (NOTE 13)
LED 14	UPPER RIGHT NEAR J12 & U21	SOUND ACTIVITY	RED	OFF	NO AUDIO ROM (NOTE 14)
				ON	READING ROM INSTRUCTIONS
				BLINKING	NORMAL OPERATION

#### NOTES:

1. Hard Disk Drive LED 1 only active in short bursts during game. May appear continuous during start up. If this LED is always on, there may be a fault that has caused the drive to be in a locked up condition.
2. LED 2 monitors a part of the ROM boot instruction set. Must be active only during power on or reset.
3. LED 3 monitors a part of the ROM boot instruction set. Must be active only during power on or reset.
4. Boot ROM is only active in short bursts during start up. May appear very irregular during circuit reset.
5. I/O ASIC is only active in short bursts during start up. Must be on continuously during game play.
6. Indicates packet activity is occurring on the network. May appear to be continuous during game play. This LED will not be active if the game is not linked. This could also be caused by a hub fault.
7. LED 7 monitors a regulated power supply voltage source. Must be on continuously at all times.
8. LED 8 monitors a regulated power supply voltage source. Must be on continuously at all times.
9. LED 9 monitors a regulated power supply voltage source. Must be on continuously at all times.
10. Intermittent wiring or hub problems may cause blinking. Must be continuous at all times when linked.
11. Indicates packet activity is occurring on the network. May appear continuous during game play. This LED will not be active if the game is not linked. This could also be caused by a hub fault.
12. Indicates packet activity is occurring on the network. May appear continuous during game play. This could also be caused by a hub fault. This LED will not be active if the game is not linked.
13. This LED is not used for this game. It is not found on this version of the printed circuit board.
14. Sound is only active in short bursts during start up. Must be on continuously during game play.



**MOTOR BOARD LED INDICATOR STATUS CHART**

DESIGNATION	LOCATION	FUNCTION	COLOR	STATE	MEANING
CR_PWRX	UPPER RIGHT NEAR Q3 & R58	LEADER ACTIVITY	RED	OFF	DRIVER NOT LEADING RACE
				ON	LEAD POSITION (NOTE 1)
				BLINKING	NORMAL OPERA- TION (NOTE 2)
CR_DIR	MIDDLE RIGHT NEAR C47 & R58	DIRECTION INDICATOR	RED	OFF	RIGHT TURN
				ON	LEFT TURN
				BLINKING	NORMAL OPERATION
OVR_TEMP	MIDDLE RIGHT NEAR CR12 & L1	HIGH TEMP INDICATOR	RED	OFF	NORMAL OPERATION
				ON	OVER HEAT (Note 3)
				BLINKING	(Note 4)

(Continued on next page)

**NOTES:**

1. Indicates all other cars are behind your current position on the track.
2. Changes each time the race leader is passed. This LED is in parallel with the dashboard Leader Light.
3. Gain is reduced to cut power dissipation when output devices get too hot. Gain is restored after cooling.
4. Temperature is at threshold of upper limit. Condition may be caused by insufficient air flow over board.

**THERE ARE NO LED STATUS INDICATORS ON THE AUDIO BOARD ASSEMBLY.**

## NOTES...

[illegible]





# **SAN FRANCISCO**

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## **SECTION FOUR**

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## **TROUBLESHOOTING**

This game uses complex electronic components that are very SENSITIVE to static electricity. The following precautions must be observed and followed prior to handling any of the game electronics.

1. Ensure that the A.C. power to the game is turned OFF prior to servicing the electronics.
2. Discharge any static electricity build up in your body by touching the safety ground stud of the power supply chassis while the line cord is connected to a properly grounded outlet. This is to be done BEFORE touching or handling the electronic assemblies.
3. Store the electronic assemblies in an anti-static area. Anti-static bags are to be used to store or transport the game CPU Board Assembly.
4. DO NOT remove or connect any electronic assemblies when the cabinet power is ON. Doing so will damage the electronic assemblies and void the warranty.
5. Always replace ground wires, shields, safety covers, etc. when maintenance or service is completed. Ensure that all ground and mounting screws are installed and tightened firmly.

## GAME DOES NOT START

### 1. Game appears completely non-functional; no audio, no illumination, no video display.

- A: Check that the Power Switch has been turned ON (center left rear corner of the game cabinet).
- B: Turn OFF the game power. Unplug the A.C. line cord. Examine the Power Supply A.C. fuse. The Power Supply Line Voltage Switch must be set to agree with the local A.C. line voltage.
- C: Remove the Line Cord. Test the line cord, power plug and I.E.C. connector for breaks or damage. Verify continuity of each wire in the cord. Fully seat connector in the supply receptacle.
- D: Unlock and open the rear door. Lift the door up and out, then remove it and set aside. Ensure that cabinet wiring harness connectors are fully seated in the corresponding A.C. and D.C. Power Supply Assembly connectors (refer to Power Wiring Diagram, Section Three).
- E: Examine the D.C. Fuses on the electronic equipment shelf. If either fuse is faulty, replace it with an identical fuse from the spare parts bag. Replace the spare fuse when repairs are complete.
- F: Fully seat the A.C. plug in the outlet. Verify that A.C. line voltage is present. Turn the game power ON. Check the D.C. wiring harness and connectors if the fuse opens the circuit again.

### 2: Video game appears non-functional, but coin door price indicator is illuminated.

- A: Unlock and hold the cabinet rear door partially open. Inspect the CPU Board Assembly under low light level conditions. A glow will be seen from the Light Emitting Diodes if there is voltage in the processor circuits. This does not mean that voltages or signals are as they should be, but it does indicate that the CPU Board is receiving some D.C. power from the Power Supply.
- B: Turn OFF the game power. Remove the cabinet rear door. Inspect the CPU Board Assembly. Ensure that the JAMMA Wire Harness connector is attached and fully seated onto the mating board connector. Check the other wiring harness connectors in the same way.



**CAUTION: DO NOT REMOVE OR INSTALL ANY CONNECTOR WHEN POWER IS TURNED ON. DOING SO WILL DAMAGE THE GAME CPU BOARD ASSEMBLY AND VOID THE WARRANTY.**

- C: Verify that the game CPU DIP Switches are set as intended. Refer to Switches and Jumpers page (Section One) for variables and default settings.
- D: Turn ON the game power. Using the 20 Volt D.C. setting on a digital voltmeter, measure D.C. voltages present at the Power connector pins. Adjust the +5V source only if necessary. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information and voltage limits.
- E: Using the 2 Volt A.C. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- F: Verify that the game runs and completes the Power On Test sequence without any errors. Note errors and/or failures found during these tests. *Do not touch the steering wheel during testing.*
- G: Enter the game Menu System by pressing and holding the TEST MODE switch inside the coin door. From the SELF TEST menu, choose the MONITOR TESTS (refer to Section One for additional details). Use this set of tests to check the operation of each screen used in the game.

## **GAME CAN NOT BE PLAYED**

### **1. Game will not accept currency or tokens and cannot be started. Audio and video are present.**

- A: Unlock and open the cash door. Empty the cash box. Inspect the revenue for any counterfeit currency. Check the vault and remove any items that block the path from the mechanism.
- B: Unlock and open the coin door. Check each mechanism by hand to ensure proper mounting. Remove the mechanism and clear the currency path. Reinstall the mechanism and latch it.
- C: Verify that the mechanism is level when the doors are closed. Repair or replace the coin door if it is bent or damaged. Adjust the cabinet leg levelers if necessary to keep mechanisms vertical.
- D: Enter the game Menu System by pressing and holding the TEST MODE switch inside the coin door. From the SELF TEST menu, choose COIN OPTIONS (refer to Section One for additional details). Use these tests to confirm the pricing and setup of each mechanism used in the game.
- E: Enter the game Menu System by pressing and holding the TEST MODE switch inside the coin door. From the SELF TEST menu, choose the CONTROL TESTS (refer to Section One for additional details). Use this set of tests to check the operation of each coin or bill mechanism.

### **2. Game accepts currency or tokens, but does not start. Audio and video are present.**

- A: Unlock and open the coin door. Check each mechanism by hand to ensure proper mounting. Verify that each of the release latches is in the closed and locked position. Test known good and bad coins to see if the mechanism accepts and rejects the currency correctly.
- B: Ensure that no loose parts or wires are caught in the hinges, latches, or switch contacts.
- C: Inspect to see if the external coin door indicators (pricing, flashing arrows, etc.) are illuminated. Check connectors and cables for wiring continuity from CPU Board to the coin mechanisms.
- D: Enter the game Menu System by pressing and holding the TEST MODE switch inside the coin door. From the SELF TEST menu, choose COIN OPTIONS (refer to Section One for additional details). Use these tests to confirm the pricing and setup of each mechanism used in the game.
- E: Check for continuity in each of the suspect switch connections (Common to Normally Open or Common to Normally Closed). Replace faulty switches (bent levers, broken actuators, etc.).
- F: Verify that each coin mechanism is operating properly by placing it in a known good unit.

### **3. Game does not accept paper currency. Coin mechanism operates properly.**

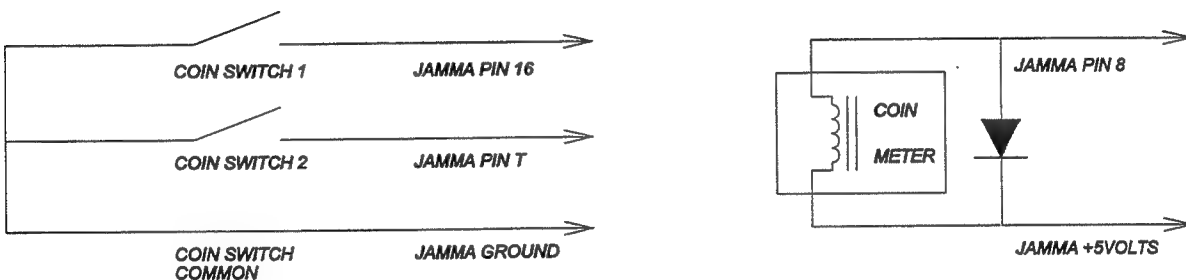
- A: Dollar bill validators or other currency acceptors may be installed in games manufactured with the additional wiring connector (DBV ready). Some units may require modification to fit the coin door; the recommended installation procedure is elsewhere in this manual (refer to Servicing in Section One). The Power Wiring Diagram (Section Three) shows the DBV power and signal connections.
- B: Ensure that the electronic signals from the Dollar Bill Validator are recognized by the game. Enter the game Menu System by pressing and holding the TEST MODE switch inside the coin door. From the SELF TEST menu, choose COIN OPTIONS (refer to Section One for additional details). Consult the manufacturer's information if changes are needed at the validator assembly.

**4. Game accepts currency or tokens, but number of credits per coin or bill is incorrect.**

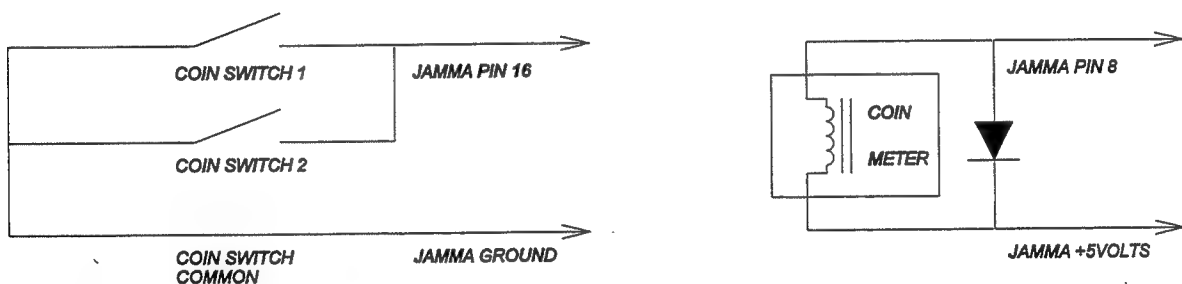
- A: Enter the game Menu System by pressing and holding the TEST MODE button inside the coin door. From the SELF TEST menu, choose COIN OPTIONS and MECH SETUP (refer to Section One for additional details). Use these tests to confirm the operation of each coin switch.
- B: From the GAME ADJUSTMENTS menu, choose CUSTOM PRICING to verify units and credits.
- C: Check that the cabinet wiring is correct for this game. Ensure that the coin meter and coin switches are properly connected to the control input wires from the JAMMA connector and other CPU wiring. Refer to the Power Wiring Diagram (Section Three) for specific wiring information.

**COIN SWITCH AND METER WIRING**

**FACTORY STANDARD**

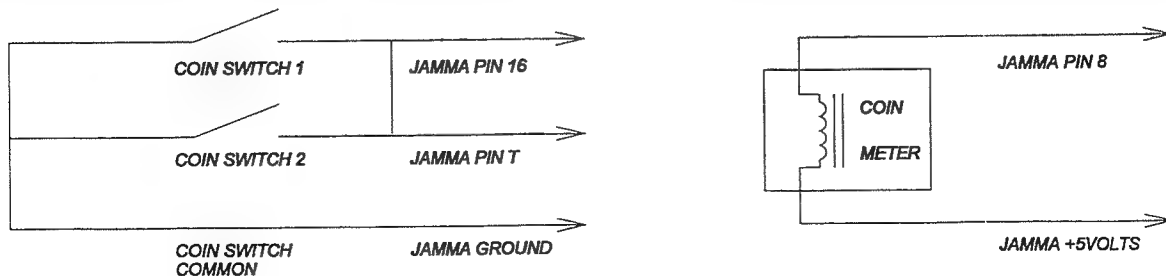


**OPTIONAL WIRING**



**INCORRECT WIRING**

A connection between JAMMA coin input pins will cause twice the desired credits for each coin inserted. A coin meter with a defective or missing diode may eventually damage driver circuits on the CPU Board.



## LINKING PROBLEMS

### 1. Cannot connect games together. Linking cables are present in each game.

- A: Crossover couplers are required to set up interconnection. Each coupler connects two games (one pair). Basic Linking Kits contain the brackets and spacers necessary to attach two cabinets.
- B: A local area network hub is needed to set up a network. Hub Link Kits permit up to eight game connections. Up to seven Basic kits can be used to construct a complete eight game array.
- C: This linking system uses 10Base-T ETHERNET communications wiring for the game data exchanges. *Do not substitute other cables or communication wiring without factory authorization.*

### 2. Game functions correctly by itself, but does not recognize other players in linking operation.

- A: Note and record any error messages that occur during self-test. Open the coin door. Press and hold the TEST MODE switch to enter the menu system. On the SELF TESTS menu, check that the car color is different for each cabinet. A unique color is required for each car in a linked race.
- B: From the SELF TESTS menu, choose NETWORK TESTS. These tests will verify some of the communication functions in this game. Verify that power is applied if a Hub is in use.
- C: Inspect the hub indicator lights. Each active port should have an illuminated indicator. If a cable is connected and there is no indicator for that position, check for cable continuity from hub to game. Ensure that no loose parts or wires are caught in the hinges, doors, or under the cabinet.
- D: Unlock and open the rear door. Verify that the linking cable is connected to the CPU Board. Compare the CPU Board LED Indicator Status Chart (refer to Section Three) against the CPU network indicators, particularly LED 6 (Receiving), LED 10 (Linking), and LED 12 (Transmitting).
- E: Verify that each linking cable is operating properly by placing it in a known good unit.

### 3. Some games in a group link properly while others do not.

- A: All linked cabinets require the same software version. Unlock the coin door and press the TEST MODE button. The software version has two dates at the bottom of the menu screen: GUTS and MAIN. It does not matter which revision level is installed, only that all games must be the same. *Do not link original San Francisco Rush games to Rush The Rock games. They are not equal!*
- B: Coupled games require crossover connections. Standard couplers appear identical to the devices supplied with Basic Link Kits, but they do not have the internal crossover. Verify that each linking crossover coupler is operating properly by placing it in a known good link between two games.
- C: Networked games do not require a crossover (the hub has an electronic crossover function). Ensure that the switches on the hub are set correctly according to the Hub Link Kit instructions. Inspect the hub indicator lights for link activity. Consult manufacturer's literature for diagnostics.
- D: *Do not use an additional crossover connector and another cable to extend a Basic or a Hub Link connection.* Two crossovers will cancel out and cause the same problem as no link crossover. Transmit and receive line pairs must interconnect for data exchange to occur between games.
- E: Separate communications wiring from other wiring, especially line cords. If unavoidable, cross at right angles to limit noise pickup. *Do not bundle network cables with any other wires.*

## PLAYER CONTROL PROBLEMS

### 1. Player controls are intermittent or completely non-functional. Game starts normally.

- A: Turn off power for one minute and turn the game on again. The automatic game POWER ON TESTS routine will test electronics and controls. The screen will report any errors on completion. *Do not touch the steering wheel or pedals during this calibration routine unless directed to do so.*
- B: Unlock and open the coin door. Enter the game Menu System by pressing and holding the TEST MODE switch inside the coin door. From the SELF TEST menu, choose the CONTROLS TEST (refer to Section One for additional details). Use these tests to confirm the operation of each switch and light used in the game.
- C: Check that the cabinet wiring is correct for this game. Ensure that the controls are properly connected to the control input wires from the JAMMA connector. Refer to the Power Wiring Diagram (Section Three) for specific wiring information.
- D: Ensure that no loose parts or wires are caught in the hinges, latches, or switch contacts. Check continuity in each of the switch connections (Common to Normally Open or Common to Normally Closed). Verify that the control is operating properly by placing in a known good unit.
- E: Verify that dashboard switch light bulbs are the type specified in the parts listing. Other bulbs will light, but the higher heat level can cause the switches to bind or stick after hours of operation.

### 2: Steering wheel is partly functional, but video is present and game appears to start normally.

- A: Turn off power for one minute and turn the game on again. The automatic game POWER ON TESTS routine will test electronics and controls. The screen will report any errors on completion. *Do not touch the steering wheel or pedals during this calibration routine unless directed to do so.*
- B: With the game power ON, check the flow of air from each of the fans at the rear of the cabinet.
- C: Unlock and hold the cabinet rear door partially open. Inspect the Motor Board Assembly under low light level conditions. A glow will be seen from the Light Emitting Diodes if there is voltage in the motor driver circuits. This does not mean that voltages or signals are as they should be, but it does indicate that the Motor Board is receiving some A.C. power from the transformer.



**WARNING: Motor Driver Board heatsink, power resistors, and other components may be very HOT. The D.C. Motor in the Steering Wheel Assembly may also have become HOT.**

- D: Examine the fuses and cables on the Motor Driver Board. If any fuse is faulty, replace it with an identical fuse from the spare parts bag. Replace the spare fuse when repairs are complete.
- E: Using a digital voltmeter, verify that D.C. voltage present between the heatsink and ground is half of the full supply voltage (approx. -27V). Check the +27V, +15V, -15V, +10V and +5V sources. Refer to the Power Wiring Diagram (Section Three) for wiring information and voltage limits.
- F: Using the 2 Volt A.C. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- G: Turn OFF the game power. Adjust the seat to its maximum rear position. Open the dashboard. Support the steering wheel and remove the outer mounting screws. Remove the support and gently lower the wheel mechanism to the floor. Inspect for faulty belts, bearings, couplings, etc. Refer to Servicing Instructions for Steering Mechanism in Section to adjust the motor belt tension.
- H: Verify proper operation of game Motor Board Assembly by placing it in a known good game.

## AUDIO PROBLEMS

### 1: Audio is non-functional, but video is present and game appears to operate normally.

- A: Unlock and open the coin door. Enter the game Menu System by pressing and holding the TEST MODE switch inside the coin door. From the SELF TEST menu, choose ADJUST VOLUME (refer to Section One for additional details). Verify that the attract and game volume levels have not been set at zero. Change the levels if necessary to make the game very loud for this test.
- B: Follow the on-screen instructions to return to the first menu. From the SELF TEST menu, choose SOUND TESTS. Use these tests to confirm the operation of each speaker in the cabinet.
- C: Turn OFF the game power. Inspect each speaker and its wiring harness. Ensure that no loose parts or wires are caught in speaker cones, terminals, mounting screws, or stuck to the magnets. Do not use excess force when removing or tightening mounting screws threaded into plastic.
- D: Verify correct cabinet wiring for this game. Ensure that the speakers are properly connected to the audio output wires from the speaker connector. Verify speaker continuity. Refer to the Power Wiring Diagram (Section Three) for specific wiring information.
- E: Turn ON the game power. Using the 20 Volt D.C. setting on a digital voltmeter, measure D.C. voltages present at the Power connectors. Verify the +12V source at the Audio board. Refer to the Power Wiring Diagram (Section Three) for specific wiring information and voltage limits.
- F: Using the 2 Volt A.C. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- G: Verify proper operation of suspect Audio and CPU Boards by placing in a known good game.

### 2: The audio is distorted, muffled or missing frequencies. A constant low hum may be present.

- A: Unlock and open the coin door. Enter the game Menu System by pressing and holding the TEST MODE switch inside the coin door. From the SELF TEST menu, choose SOUND TESTS. These tests will verify some of the functions of the audio circuits in this game.
- B: Turn OFF the game power. Remove the grills and check the speakers. This game uses four speakers and one woofer. Ensure that all small speakers are 8 $\Omega$  FULL RANGE (100-10,000 Hz response) and rated for at least 15 WATTS. The 4 $\Omega$  seat speaker must rate at least 25 WATTS.
- C: Check that the speaker wiring is not reversed at one of the speakers. Weak low frequencies and a thin or hollow sound quality is a symptom of incorrectly phased speakers. This condition will not be detected by the SOUND TESTS, but it will be audible with the ADJUST VOLUME music.
- D: Check that the cabinet wiring is correct for this game. Verify that the cabinet wiring provides separate wires (not a common return) for each speaker. Ensure that all cabinet ground wires are connected. Refer to the Power Wiring Diagram (Section Three) for specific wiring information.
- E: Using the 2 Volt A.C. setting on a digital voltmeter, measure voltages at the speaker terminals. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- F: Verify that the speaker is operating properly with external signal or by placing in known good unit.

## VIDEO PROBLEMS

### 1. Monitor appears non-functional, but audio is present and controls operate as expected.

- A: Unlock and open the rear door. Verify that A.C. Power is connected to the Video Monitor. Inspect the neck of the CRT under low light level conditions. A glow will be seen near the CRT base if there is voltage in the filament circuits. This does not mean that other voltages or signals are as they should be, but it does indicate that some of the monitor circuits are receiving power.
- B: Unlock and open the coin door. The monitor adjustment controls are mounted on the rear wall. Check that the brightness (intensity) and contrast have not been set to their minimum levels.
- C: Turn OFF the game power. Verify that the Video Signal and the Remote Adjustment Board connectors are fully seated on the Video Monitor Board Assembly. Check the other monitor connectors in the same way. **Do not operate a monitor without a Remote Adjustment Board.**



**WARNING:** *CRT and Video Monitor Board may store voltage after power is turned off.*

- D: Examine the A.C. line fuse on the Video Monitor Board Assembly. If the fuse is faulty, replace it with an identical fuse of the proper voltage and current rating.
- E: Ensure that no loose parts or wires are caught on the chassis or the mounting brackets.
- F: Verify that the Video Monitor is operating correctly by placing it in a known good unit.

### 2: The Power On Tests will run, but the game does not appear. No audio is present.

- A: Note and record any error messages that occur during the Power On Test. Open the coin door. Press and hold the TEST MODE switch to enter the menu system. From the SELF TESTS menu, choose DISK TESTS. These tests will verify some of the game Hard Disk Drive functions.
- B: Turn OFF the game power. Unlock and remove the rear door. Inspect the CPU Board Assembly. Ensure that Hard Disk Drive Assembly ribbon cable and power connectors are fully seated into the mating connectors on the CPU Board. Verify that all disk drive mounting screws are installed.

**CAUTION: DO NOT REMOVE OR INSTALL ANY CONNECTOR WHEN POWER IS TURNED ON. THIS WILL DAMAGE THE CPU BOARD OR HARD DISK DRIVE AND VOID THE WARRANTY.**

- C: Check that the Hard Disk Drive Assembly is the correct part for this game. Each Hard Disk Drive is labeled with the assembly number and the software version. Refer to Parts (Section Two).
- D: Verify that the ROM instruction set is correct for this game. There is more than one ROM in a game set. Each ROM circuit is labeled with the assembly number and the software version.
- E: Verify that the CPU Board Assembly is correct for this game. Each CPU Board is marked with the manufacturer name, assembly number and the hardware version.
- F: Turn ON the game power. Using the 20 Volt D.C. setting on a digital voltmeter, measure D.C. voltages present at the drive power connector pins. Verify the +5V source if it is adjustable. Refer to the Power Wiring Diagram (Section Three) for specific wiring information and voltage limits.
- G: Using the 2 Volt A.C. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading indicates that the supply voltages are unstable and may contain ripple or noise.
- H: Compare CPU Board Light Emitting Diode states with the CPU Indicator Chart (Section Three). Press the CPU reset button (near the battery) and observe the start up sequence of the LEDs.

**3. Monitor will not lock onto the signal and provide a stable picture, colors are missing, etc.**

- A: Unlock the coin door. Adjust vertical and horizontal hold controls at the remote adjustment board.
- B: Check connectors and cables for wiring continuity from the CPU Board to the video monitor. Check connectors and cables for wiring continuity from the adjustment board to the video monitor.
- C: Ensure that the Video Monitor Assembly is correct for this game. Use of video monitors with different resolution will result in what appears to be horizontal tearing or complete loss of sync.
- D: Verify that the Video Monitor is operating correctly by placing it in a known good unit.

**4: Game operates normally, but video picture wavers or rolls, has dark bars, uneven colors, etc.**

- A: Check connectors and cables for wiring continuity from the CPU Board to the Video Monitor. Ensure that all the cabinet ground wires are connected, especially at the Video Monitor Chassis.
- B: Move the cabinet farther away from machines, appliances, other games, etc. Very strong electrical or magnetic fields are emitted from some equipment when it is operating normally.
- C: Verify that the Video Monitor is operating correctly by placing it in a known good unit.

**MISCELLANEOUS**

**1: Marquee lamp is intermittent or non-functional. Game starts and plays normally.**

- A: Open the marquee and remove the glass. Remove the plastic lamp locks and the fluorescent tube from the holders. Install a new lamp if cracks or darkened ends are found. Clean the tube.
- B: Verify that the lamp and starter pins are making good connection with their socket contacts.
- C: Measure the Fluorescent Lamp Assembly A.C. voltages (Power Wiring Diagram, Section Three). Check wiring and connector continuity from the A.C. Power Chassis to the Lamp Assembly.
- D: Ensure that the Fluorescent Lamp Assembly is rated for the local A.C. line voltage and frequency.
- E: Check for continuity of both fluorescent lamp filaments, the starter, and the ballast. One at a time, verify that the lamp, starter, and ballast operate by placing each in a known good unit.

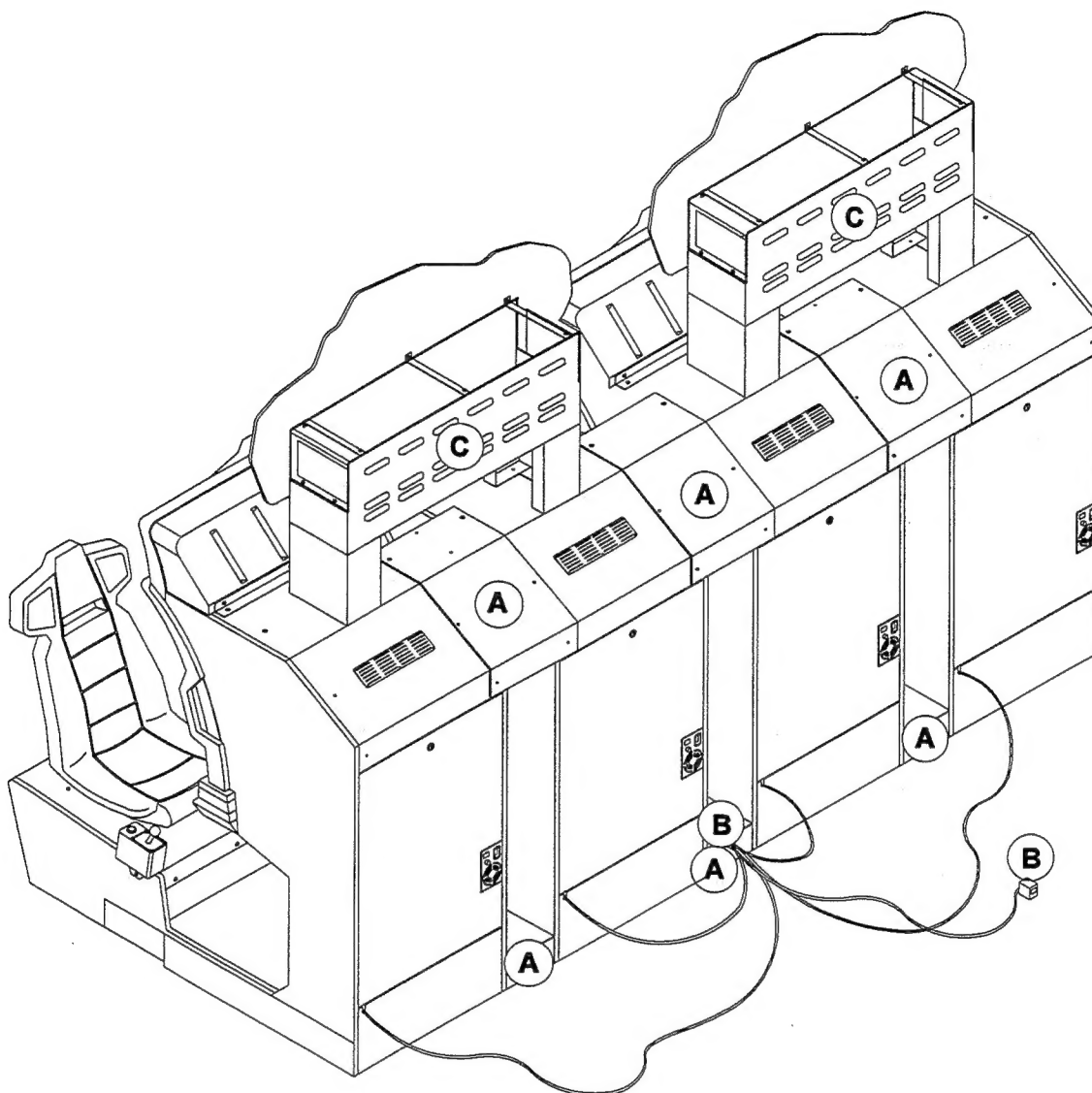
**2. Game operates normally, but fan is noticeably noisy.**

- A: Check bottom and rear of cabinet for blocked air flow. Move game away from sources of heat.
- B: Turn OFF the game power. Apply high power vacuum cleaner to vent holes to remove dust.
- C: Unlock and remove the rear door. Ensure that the fan is connected to wiring harness.

**3. Error Messages appear on the screen. The game does not start and there is no audio.**

- A: Check any assembly (RAM, ROM, Battery, etc.) identified in the Error Message.
- B: Call your authorized distributor for help with unresolved screen messages.

## OPTIONAL KITS



**TYPICAL REAR VIEW OF SEVERAL GAME CABINETS CONNECTED TO FORM AN ARRAY**

- A. 35615 BASIC LINK KIT** *One Basic Link Kit is required between each pair of cabinets.*  
Basic Link Kits attach cabinets together to form an impressive, mechanically stable game array. Upper brackets space cabinets the optimum distance apart and prevent movement caused by enthusiastic players. Lower brackets provide storage areas for linking network components.
- B. 38015 HUB LINK KIT** *A single Hub Link Kit can connect up to eight cabinets in one network.*  
The Hub Link Kit provides the electrical interconnections and the data management required for a Local Area Network (LAN). The Hub mounts in one of the lower brackets from the Basic Link Kit and has its own A.C. adapter power supply. Longer cables will allow remote Hub operation.
- C. 35715 DELUXE LINK KIT** *One Deluxe Link Kit is required over each pair of cabinets.*  
The Deluxe Link Kit mounts on top of the cabinet array to advertise the game's linking capability. Large, brightly lit graphics attract the player's attention from a distance and identify new features. The self-contained display uses long life fluorescent lamps and has no moving parts.



## WARNINGS & NOTICES

### WARNING

USE OF NON-ATARI PARTS OR CIRCUIT MODIFICATIONS MAY CAUSE SERIOUS INJURY OR EQUIPMENT DAMAGE! USE ONLY ATARI AUTHORIZED PARTS.

- \* For safety and reliability, substitute parts and modifications are not recommended.
- \* Substitute parts or modifications may void FCC type acceptance.
- \* Use only authorized components and parts. Failure to do so will void warranty and may result in incorrect and/or unsafe operation.
- \* This game is protected by federal copyright, trademark and patent laws. Unauthorized modifications may be illegal under federal law. This also applies to ATARI logos, designs, publications and assemblies. Moreover, facsimiles of ATARI equipment (or any feature thereof) may be illegal under federal law, regardless of whether or not such facsimiles are manufactured with ATARI components.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generated, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**When ATARI ships a game, it is in compliance with FCC regulations. Your compliance label is proof. If the label is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game does not contain an FCC compliance label, contact ATARI immediately.**

### WARNING

Plug this game into a properly grounded outlet to prevent shock hazards and assure proper game operation. Do not use a cheater plug to defeat the power cord's grounding pin. Do not cut off the ground pin.

### WARNING

A very small portion of the population has a condition which may cause them to experience epileptic seizures or have momentary loss of consciousness when viewing certain kinds of flashing lights or patterns that are present in our daily environment. These persons may experience seizures while watching some kinds of television pictures or playing certain video games. People who have not had any previous seizures may nonetheless have an undetected epileptic condition.

If you or anyone in your family has experienced symptoms linked to an epileptic condition (e.g. seizures or loss of awareness), immediately consult your physician before using any video games.

We recommend that parents observe their children while they play video games. If you or your child experience the following symptoms: dizziness, altered vision, eye or muscle twitching, involuntary movements, loss of awareness, disorientation, or convulsions, DISCONTINUE USE IMMEDIATELY and consult your physician.

### NOTICE

Information in this manual is subject to change without notice. ATARI reserves the right to make improvements in equipment function, design, or components as progress in engineering or manufacturing methods may warrant.

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**FOR SERVICE: CALL YOUR AUTHORIZED ATARI DISTRIBUTOR.**